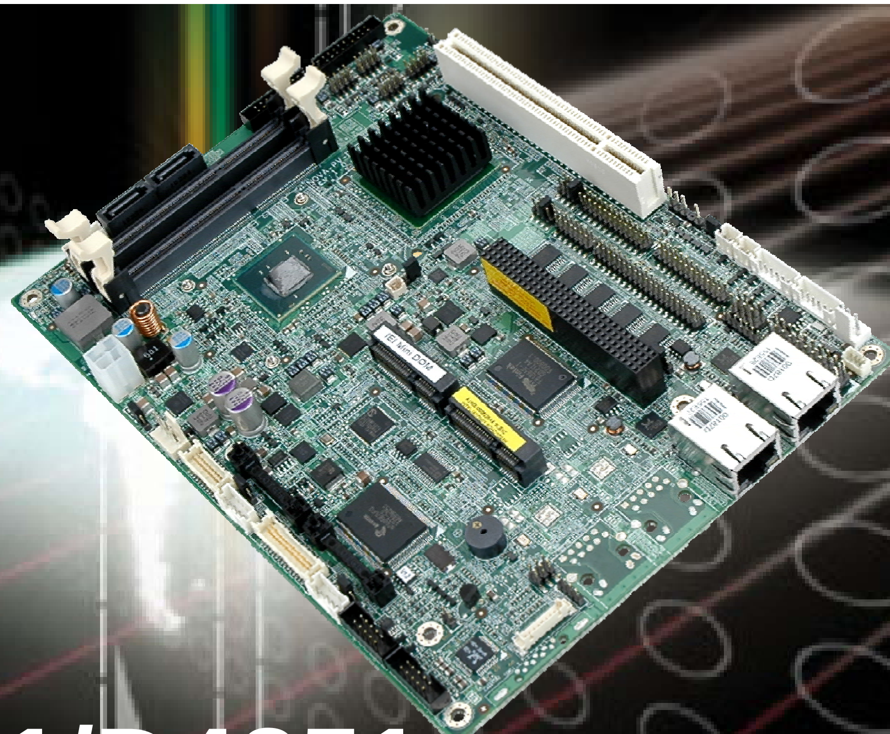


MODEL:

NOVA-D5251/D4251

5.25" Motherboard Intel® Atom™ Processor, VGA/LVDS Dual Display, Quad GbE, Eight USB 2.0, Two SATA 3Gb/s, Two PCIe Mini, PCI, PCI-104, RoHS

User Manual

Rev. 1.10 - 7 February, 2014

Revision

Date	Version	Changes
7 February, 2014	1.10	Updated for R11 version – changed audio codec to Realtek ALC662
12 December, 2012	1.01	Modified digital I/O description to 24-bit digital I/O (12-bit input, 12-bit output)
21 February, 2011	1.00	Initial release

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TRADEMARKS

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Chapter

1

Introduction

1.1 Introduction



Figure 1-1: NOVA-PV-D5251/D4251

The NOVA-PV-D5251/D4251 is a 5.25" SBC with a Intel® Atom™ D525 or D425 CPU. Up to two 2.0 GB 800 MHz DDR3 SDRAM SO-DIMMs are supported by the NOVA-PV-D5251/D4251 (system max. 4 GB). The NOVA-PV-D5251/D4251 is designed for fanless operation. The low power CPUs don't require active cooling and stay within specified heat range using the included heatsink.

Storage on the board is handled by two SATA 3Gb/s ports for connecting hard drives, optical drive or SSD. The CompactFlash® slot allows a Type II CompactFlash® card to be installed.

The board has two graphics outputs. A VGA output connects to a traditional VGA monitor. Two LVDS connectors support 24-bit dual-channel and 18-bit single-channel displays.

Eight USB 2.0 channels, one PCI socket, two PCIe Mini sockets and one PCI-104 slot provide flexible expansion options. High Definition Audio (HDA) support ensures HDA devices can be easily implemented on the NOVA-PV-D5251/D4251. Serial device connectivity is provided by four internal RS-232 and one internal RS-232/422/485 connectors.

1.2 Model Variations

There are three models of the NOVA-PV-D5251/D4251 motherboard. The model variations are listed in **Table 1-1** below.

Model	CPU	PCIe GbE	LVDS	COM Ports
NOVA-PV-D5251-G4	Intel® Atom™ D525	Four RJ-45	18-bit single-channel	1 x DB-9 RS-232 4 x Internal RS-232 1 x Internal RS-232/422/485
NOVA-PV-D4251-G2L2	Intel® Atom™ D425	Two RJ-45	18-bit single-channel & 24-bit dual-channel	4 x Internal RS-232 1 x Internal RS-232/422/485
NOVA-PV-D5251-G2L2	Intel® Atom™ D525			

Table 1-1: Model Variations

1.3 Benefits

Some of the NOVA-PV-D5251/D4251 motherboard benefits include:

- Low power consumption
- Wide range of I/O interfaces
- Dual display support

1.4 Features

Some of the NOVA-PV-D5251/D4251 motherboard features are listed below:

- 5.25" form factor
- Fanless design
- RoHS compliant
- Up to four GbE ports
- Up to six serial ports
- Eight USB 2.0 ports
- Two PCIe Mini card slots
- CompactFlash® Type II slot

1.5 Connectors

The connectors on the NOVA-PV-D5251/D4251 are shown in the figure below.

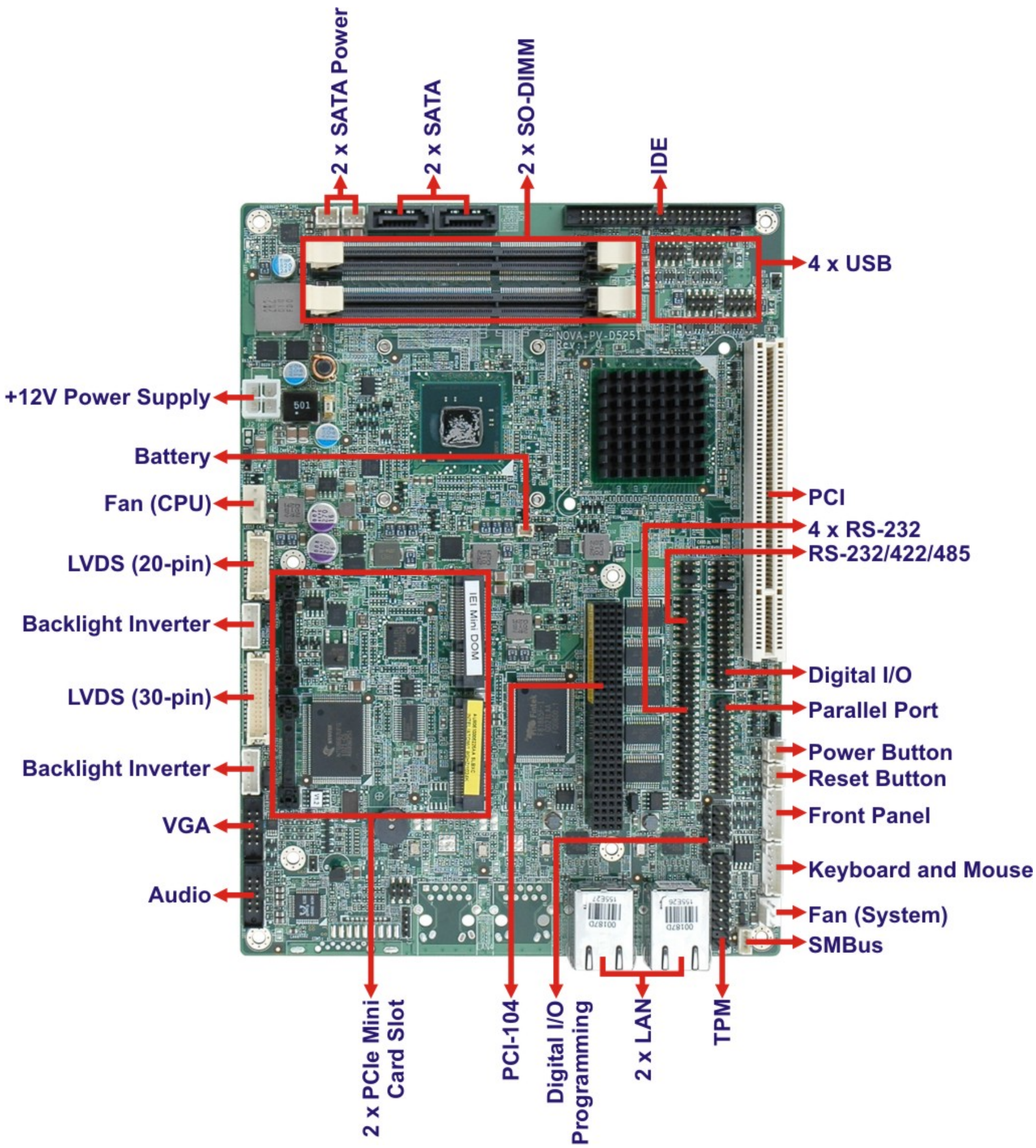


Figure 1-2: Connectors

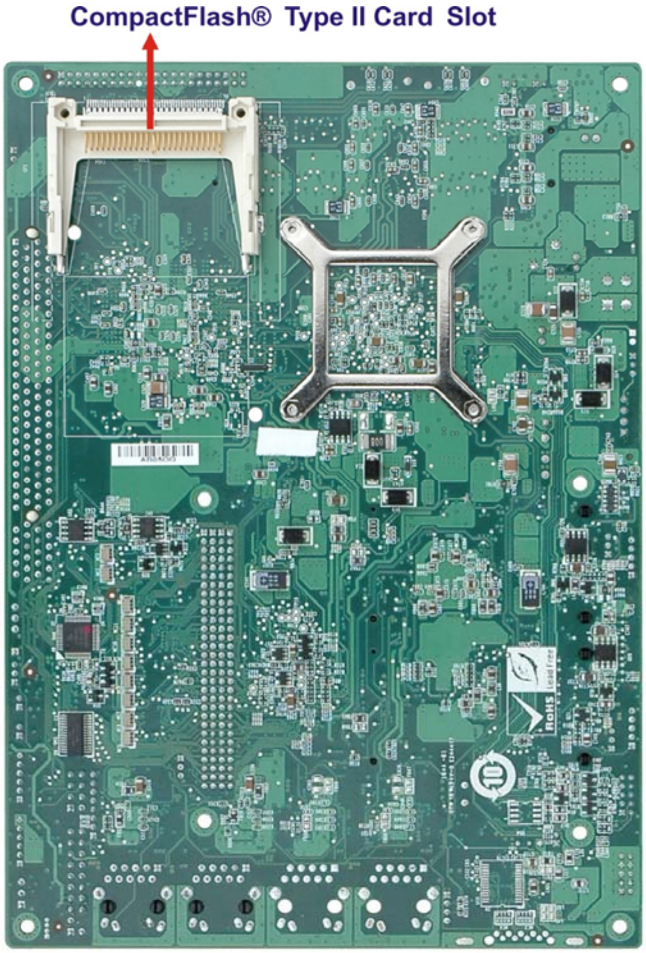


Figure 1-3: Connector (Solder Side)

1.6 Dimensions

The dimensions of the board are listed below:

- **Length**: 203.20 mm
- **Width**: 146.05 mm

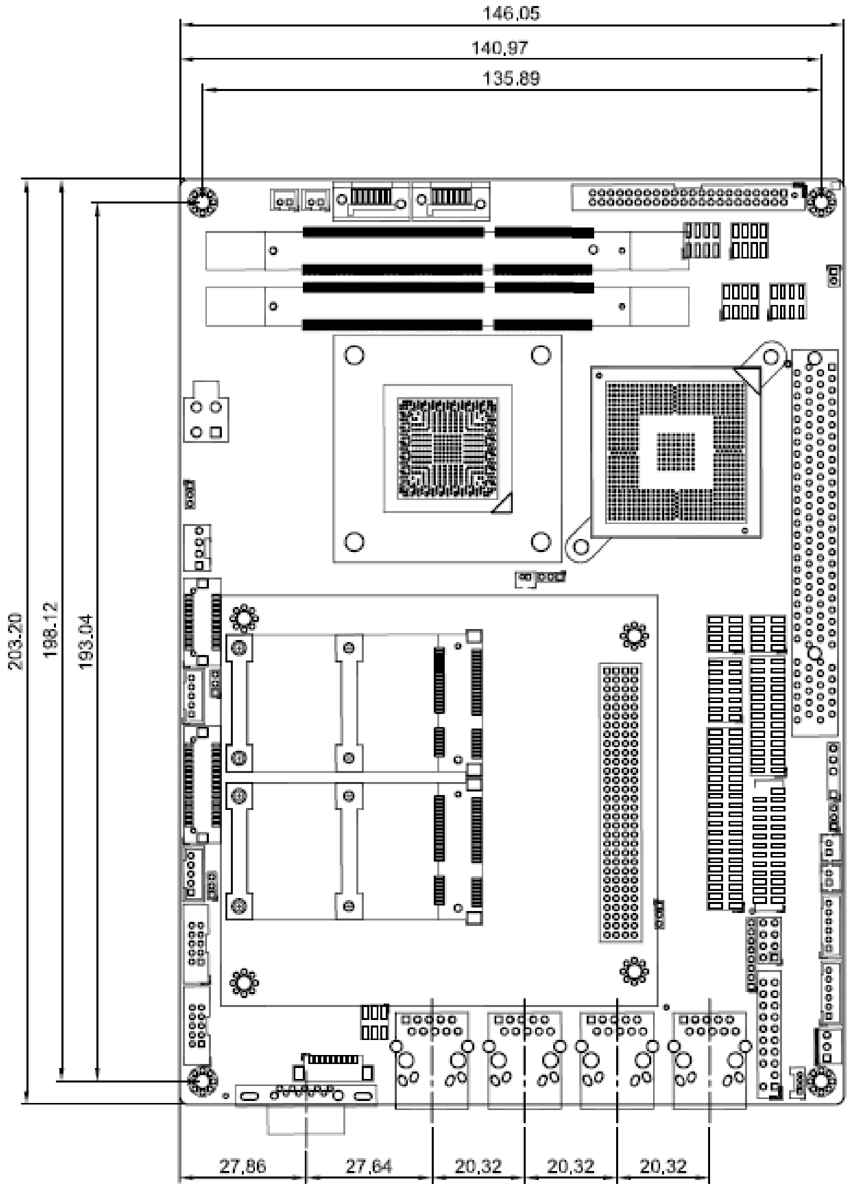


Figure 1-4: NOVA-PV-D5251/D4251 Dimensions (mm)

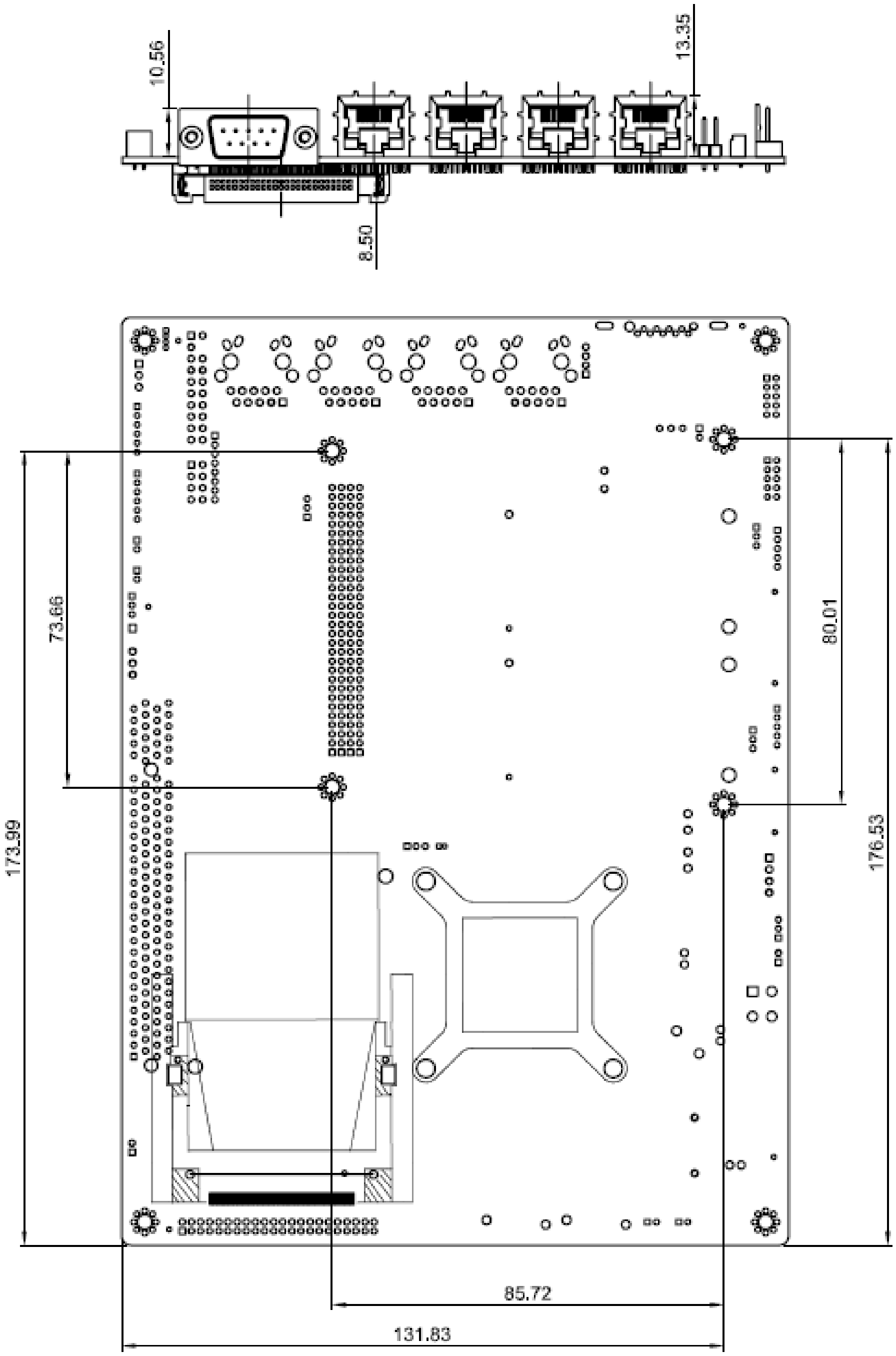


Figure 1-5: NOVA-PV-D5251/D4251 Dimensions (mm)

1.7 Data Flow

Figure 1-6 shows the data flow between the CPU, the chipset and other components installed on the motherboard and described in the following sections of this chapter.

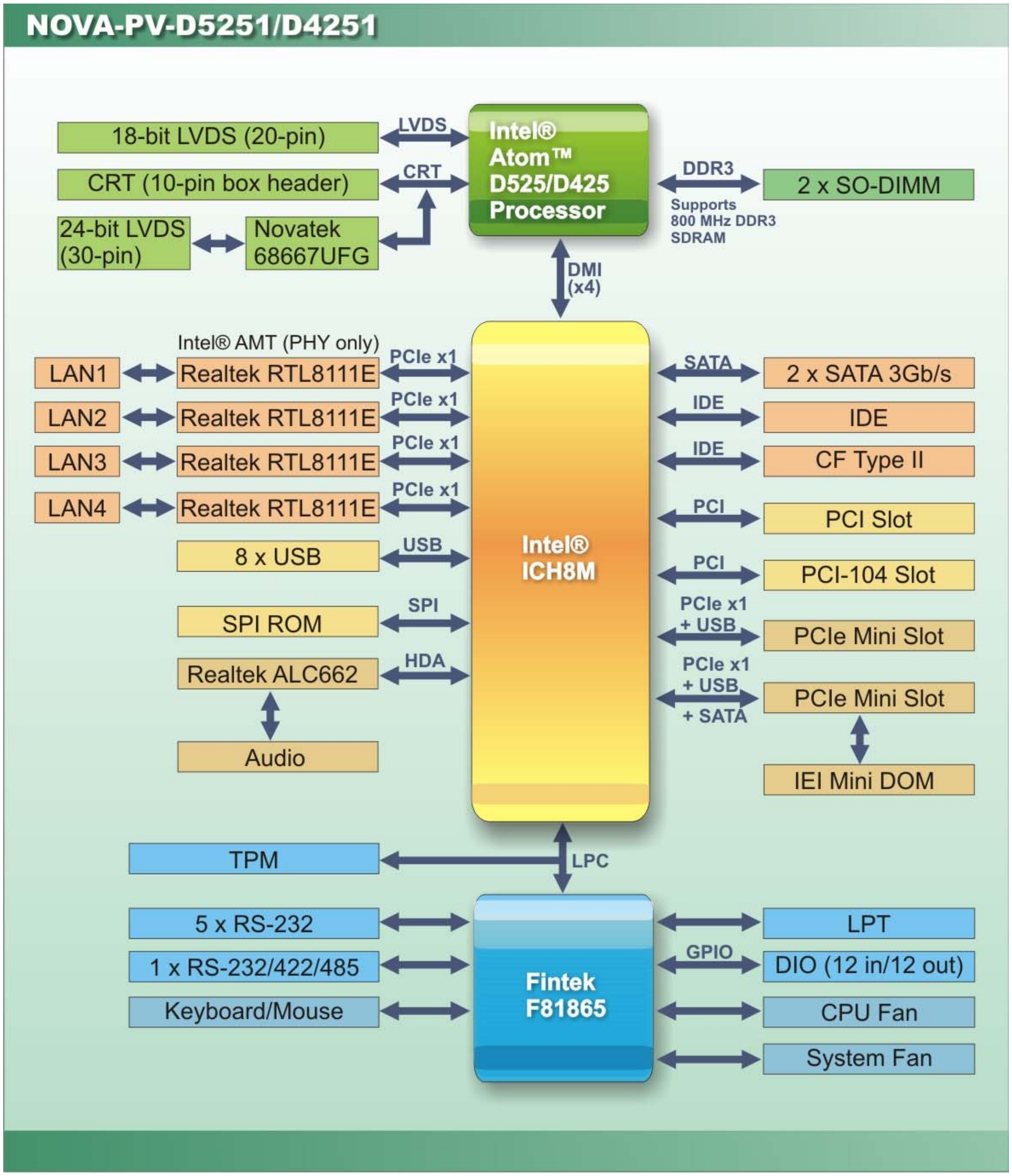


Figure 1-6: Data Flow Block Diagram

1.8 Technical Specifications

NOVA-PV-D5251/D4251 technical specifications are listed in table below.

Specification	NOVA-PV-D5251/D4251
Form Factor	5.25"
Socket	Embedded
CPU Supported	1.8 GHz Intel® Atom™ D525 dual-core CPU with 1 MB L2 cache 1.8 GHz Intel® Atom™ D425 single-core CPU with 512 KB L2 cache
Express Chipset	Intel® ICH8M
Memory	Two 204-pin SO-DIMM sockets support two 800 MHz DDR3 SDRAM SO-DIMMs (system max. 4 GB)
Graphics Engine	Intel® GMA3150 (Gen 3.5 DX9, 400 MHz)
Integrated Graphics	-- Analog CRT (CRT hot plug supported): up to 2048x1536 -- 18-bit single-channel LVDS: up to 1366x768 or 1024x768 -- 24-bit dual-channel LVDS by Novatek 68667UFG. Supported resolutions: ▪ 640x480 ▪ 800x600 ▪ 1024x768 ▪ 1280x1024 ▪ 1366x768 ▪ 1920x1080
Audio	5.1 channel HD Audio codec - Realtek ALC662
LAN	Four Realtek RTL8111E PCIe GbE controllers support four/two RJ-45 GbE ports (refer to **Table 1-1**) (LAN1 with ASF 2.0 support)
Super I/O	Fintek F81865
BIOS	UEFI BIOS
Digital I/O	24-bit digital I/O (12-bit input/12-bit output)
Watchdog Timer	Software programmable supports 1~255 sec. system reset
TPM	Optional on-board Infineon module

Specification	NOVA-PV-D5251/D4251
Expansion	
PCI	One PCI slot
PCIe	Two PCIe Mini slots (one supports IEI mini DOM)
PCI-104	One PCI-104 slot
I/O Interface Connectors	
Audio Connector	One internal audio connector (10-pin box header)
Serial Ports	Four RS-232 COM connectors via 40-pin header One RS-232/422/485 COM connector via 14-pin header One optional external RS-232 DB-9 connector
USB 2.0/1.1 Ports	Eight internal USB ports via four 8-pin headers
Parallel Port	One internal parallel port via one 26-pin header
Keyboard/Mouse	One keyboard/mouse connector via one 6-pin wafer
Fan Connectors	One 4-pin CPU fan connector One 3-pin system fan connector
SMBus	One SMBus connector via one 4-pin wafer
Storage	
Serial ATA	Two SATA 3Gb/s connectors Two 5V SATA power connectors
IDE	One 44-pin IDE connector
CompactFlash®	One CF Type II slot (solder side)
Environmental and Power Specifications	
Power Supply	12 V only ATX and AT power supported
Power Connector	One internal 4-pin Molex power connector for power supply
Power Consumption	12V@1.46A (1.8 GHz Intel® Atom™ D525 dual-core CPU with two 1 GB DDR3 SO-DIMMs)

Specification	NOVA-PV-D5251/D4251
Operating Temperature	D525: -20ºC ~ 60ºC with free air; -20ºC ~ 70ºC with force air D425: -20ºC ~ 65ºC with free air; -20ºC ~ 70ºC with force air
Humidity	5% ~ 95% (non-condensing)
Physical Specifications	
Dimensions	203 mm x 146 mm
Weight GW/NW	1000 g / 400 g

Table 1-2: Technical Specifications

Chapter

2

Unpacking

2.1 Anti-static Precautions

WARNING!

Static electricity can destroy certain electronics. Make sure to follow the ESD precautions to prevent damage to the product, and injury to the user.

Make sure to adhere to the following guidelines:

- ***Wear an anti-static wristband***: Wearing an anti-static wristband can prevent electrostatic discharge.
- ***Self-grounding***: Touch a grounded conductor every few minutes to discharge any excess static buildup.
- ***Use an anti-static pad***: When configuring any circuit board, place it on an anti-static mat.
- ***Only handle the edges of the PCB***: Don't touch the surface of the motherboard. Hold the motherboard by the edges when handling.

2.2 Unpacking Precautions

When the NOVA-PV-D5251/D4251 is unpacked, please do the following:

- Follow the antistatic guidelines above.
- Make sure the packing box is facing upwards when opening.
- Make sure all the packing list items are present.

2.3 Packing List

NOTE:

If any of the components listed in the checklist below are missing, do not proceed with the installation. Contact the IEI reseller or vendor the NOVA-PV-D5251/D4251 was purchased from or contact an IEI sales representative directly by sending an email to sales@iei.com.tw.

The NOVA-PV-D5251/D4251 is shipped with the following components:

Quantity	Item and Part Number	Image
1	NOVA-PV-D5251/D4251 motherboard	
1	Audio cable (**P/N:** 32007-002600-100-RS)	
1	Keyboard and mouse Y cable (**P/N**: 32006-001100-100-RS)	
1	Quad RS-232 cable (**P/N**: 32205-002000-100-RS)	
1	SATA and 5 V power cable (**P/N:** 32801-000201-100-RS)	
1	USB cable (**P/N:** 32000-070301-RS)	

1	VGA cable (**P/N:** 32003-000900-100-RS)	
1	Mini jumper pack (2.0mm)	
1	Utility CD	
1	One Key Recovery CD	
1	Quick Installation Guide	

2.3.1 Optional Items

The following are optional components which may be separately purchased:

Item and Part Number	**Image**
CPU cooler (**P/N**: 19FFD124010HB2A7-000001-RS)	
IDE cable (**P/N**:32200-000009-RS)	
LPT cable (**P/N**: 32200-015100-RS)	

RS-232/422/485 cable (**P/N**: 32205-000300-100-RS)	
Infineon TPM module (**P/N**: TPM-IN01-R11)	

Chapter

3

Connectors

3.1 Peripheral Interface Connectors

This chapter details all the jumpers and connectors.

3.1.1 NOVA-PV-D5251/D4251 Layout

The figures below show all the connectors and jumpers.

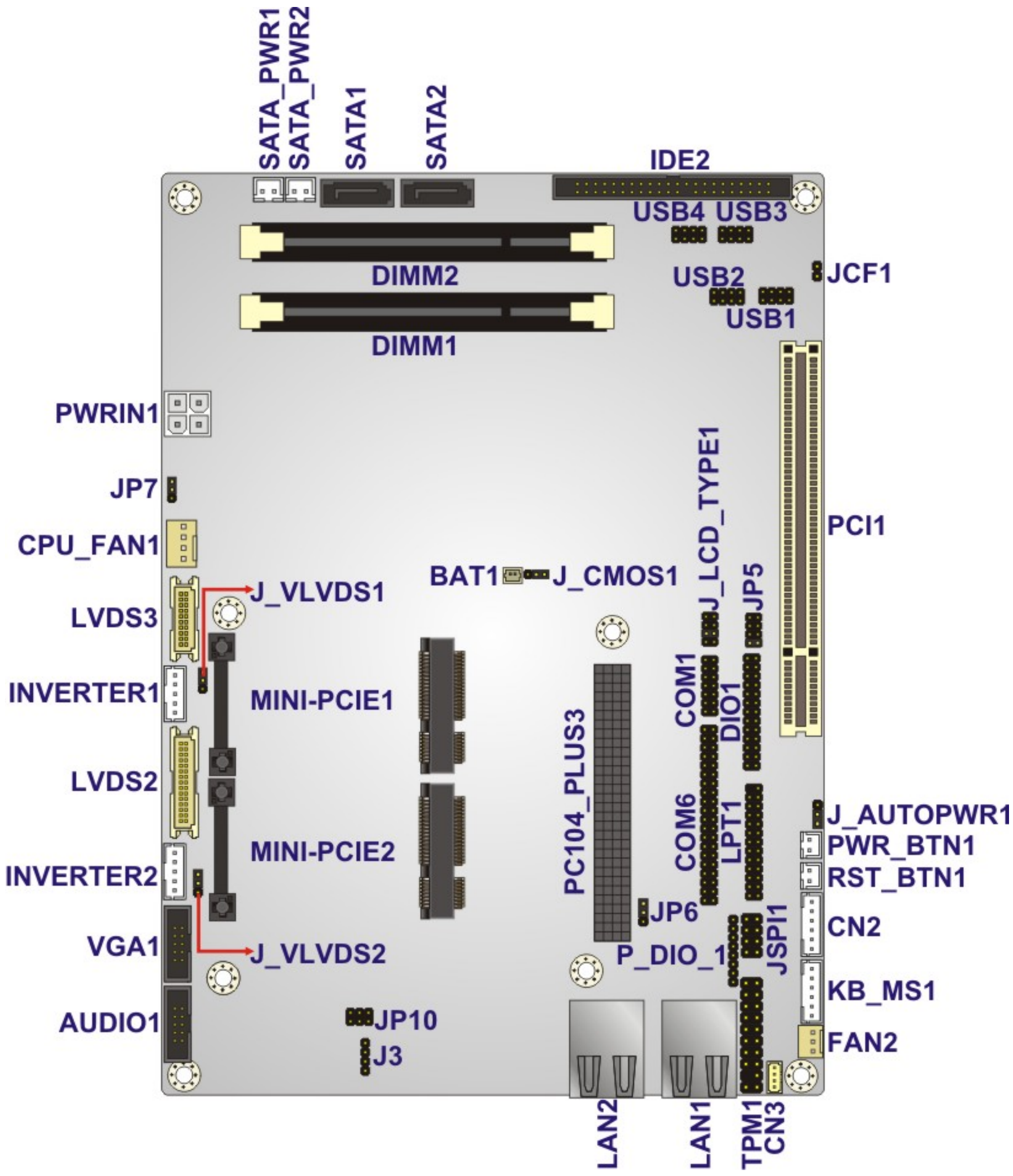


Figure 3-1: Connector and Jumper Locations

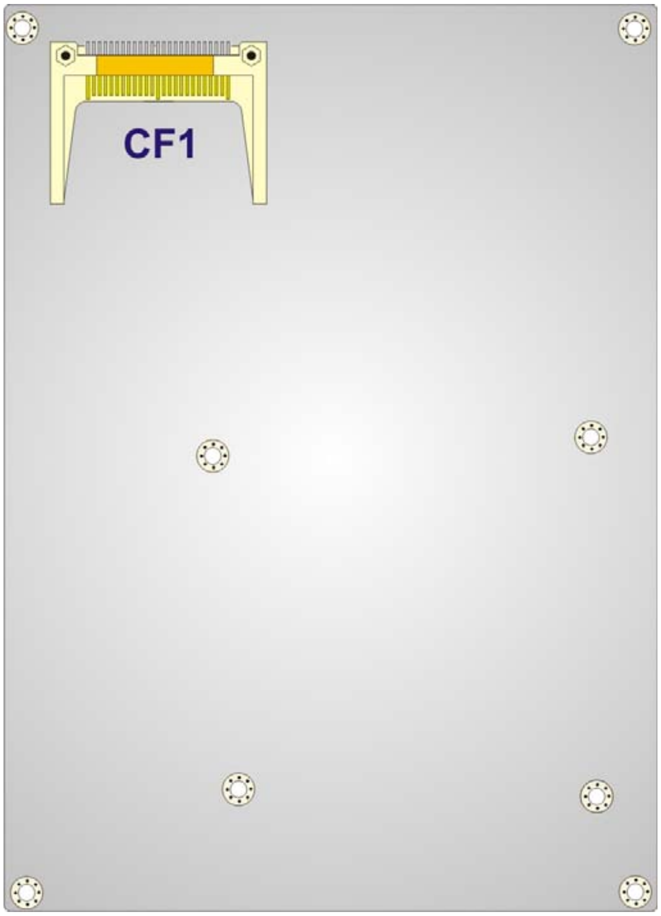


Figure 3-2: Connector Location (Solder Side)

3.1.2 Peripheral Interface Connectors

The table below lists all the connectors on the board.

Connector	Type	Label
Audio connector	10-pin box header	AUDIO1
Battery connector	2-pin wafer	BAT1
CompactFlash® card slot	CF card slot	CF1
DDR3 SO-DIMM socket	204-pin socket	DIMM1
DDR3 SO-DIMM socket	204-pin socket	DIMM2
Digital I/O connector	26-pin header	DIO1

Digital I/O programming connector	8-pin header	P_DIO_1
Fan connector (CPU)	4-pin wafer	CPU_FAN1
Fan connector (system)	3-pin wafer	FAN2
Front panel connector	6-pin wafer	CN2
IDE connector	44-pin box header	IDE1
Keyboard and mouse connector	6-pin wafer	KB/MS1
LVDS backlight inverter connector	5-pin wafer	INVERTER1
LVDS backlight inverter connector	5-pin wafer	INVERTER2
LVDS connector (18/24-bit, dual-channel)	30-pin crimp	LVDS2
LVDS connector (18-bit, single-channel)	20-pin crimp	LVDS3
Parallel port connector	25-pin header	LPT1
PCI-104 slot	PCI-104 slot	PC104_PLUS3
PCI slot	PCI slot	PCI1
PCIe Mini card slot	PCIe Mini card slot	MINI-PCIE1
PCIe Mini card slot	PCIe Mini card slot	MINI-PCIE2
Power connector (+12V, power supply)	4-pin connector	PWRIN1
Power button connector	2-pin wafer	PWR_BTN1
Reset button connector	2-pin wafer	RST_BTN1
Serial ATA (SATA) drive connector	7-pin SATA	SATA1
Serial ATA (SATA) drive connector	7-pin SATA	SATA2
SATA power connector	2-pin wafer	SATA_PWR1
SATA power connector	2-pin wafer	SATA_PWR2
Serial port connector (RS-232)	40-pin header	COM1
Serial port connector (RS-232/422/485)	14-pin header	COM6

SMBus connector	4-pin wafer	CN3
SPI Flash connector	8-pin header	JSPI1
TPM connector	20-pin header	TPM1
USB connector	8-pin header	USB1
USB connector	8-pin header	USB2
USB connector	8-pin header	USB3
USB connector	8-pin header	USB4
VGA connector	10-pin box header	VGA1

Table 3-1: Peripheral Interface Connectors

3.1.3 External Interface Panel Connectors

The table below lists the connectors on the external I/O panel.

Connector	Type	Label
Ethernet connector	RJ-45	LAN1
Ethernet connector	RJ-45	LAN2
Ethernet connector (optional)	RJ-45	LAN3
Ethernet connector (optional)	RJ-45	LAN4
RS-232 COM port (optional)	DB-9	COM5

Table 3-2: Rear Panel Connectors

3.2 Internal Peripheral Connectors

The section describes all of the connectors on the NOVA-PV-D5251/D4251.

3.2.1 Audio Connector

CN Label: **AUDIO1**

CN Type: 10-pin box header (2x5)

CN Location: See **Figure 3-3**

CN Pinouts: See **Table 3-3**

The audio connector is connected to external audio devices including speakers and microphones for the input and output of audio signals to and from the system.

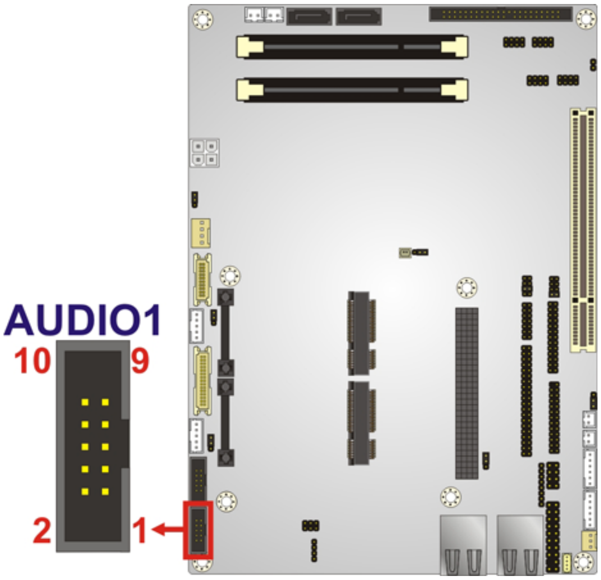


Figure 3-3: Audio Connector Location

Pin	Description	Pin	Description
1	Line out-R	2	Line in-R
3	GND	4	GND
5	Line out-L	6	Line in-L
7	GND	8	GND
9	MIC in-R	10	MIC in-L

Table 3-3: Audio Connector Pinouts

3.2.2 Battery Connector

CAUTION:

Risk of explosion if battery is replaced by an incorrect type. Only certified engineers should replace the on-board battery.

Dispose of used batteries according to instructions and local regulations.

CN Label:	**BAT1**
CN Type:	2-pin wafer (1x2)
CN Location:	See **Figure 3-4**
CN Pinouts:	See **Table 3-4**

This is connected to the system battery. The battery provides power to the system clock to retain the time when power is turned off.

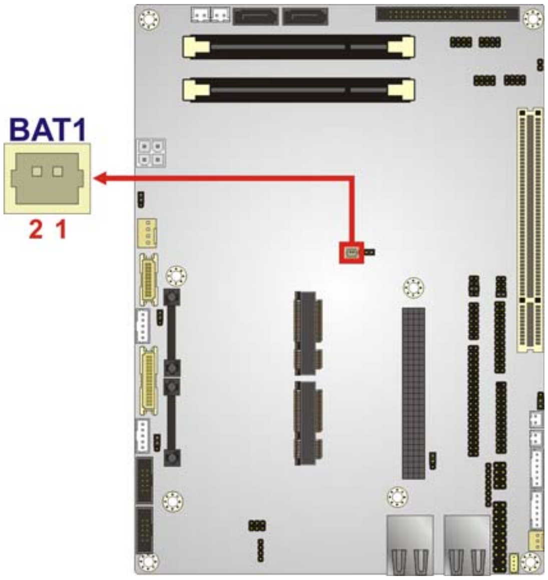


Figure 3-4: Battery Connector Location

Pin	Description
1	Battery+ (+3.3V)
2	Ground

Table 3-4: Battery Connector Pinouts

3.2.3 CompactFlash® Slot

NOTE:

1. Both CompactFlash® Type I and Type II cards are supported.
2. To use SATA and CF, CF must be set to slave.

CN Label: **CF1**

CN Type: CompactFlash® card slot (solder side)

CN Location: See **Figure 3-5**

CN Pinouts: See **Table 3-5**

A CompactFlash® Type I or Type II card can be used in this slot.

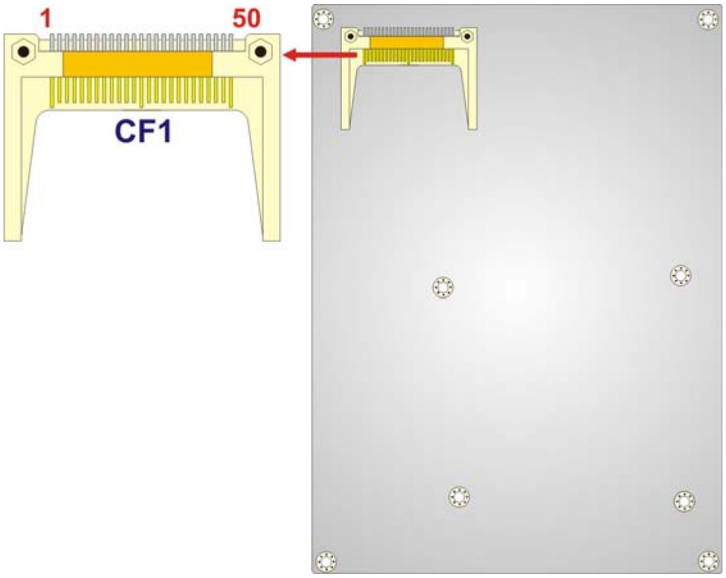


Figure 3-5: CompactFlash® Slot Location

Pin	Description	Pin	Description
1	GND	26	CD1#
2	D3	27	D11
3	D4	28	D12
4	D5	29	D13
5	D6	30	D14
6	D7	31	D15
7	CE#	32	CE2#
8	A10	33	VS1#
9	OE#	34	IOR#
10	A9	35	IOW#
11	A8	36	WE#
12	A7	37	IRQ
13	VCC	38	VCC
14	A6	39	CSEL#
15	A5	40	VS2#
16	A4	41	RESET#
17	A3	42	WAIT#
18	A2	43	INPACK#
19	A1	44	REG#
20	A0	45	BVD2
21	D0	46	BVD1
22	D1	47	D8
23	D2	48	D9
24	IOCS16#	49	D10
25	CD2#	50	GND2

Table 3-5: CompactFlash® Slot Pinouts

3.2.4 DDR3 SO-DIMM Connectors

CN Label: **DIMM1, DIMM2**

CN Type: 204-pin DDR3 SO-DIMM connector

CN Location: See **Figure 3-6**

The SO-DIMM connector is for installing memory on the system.

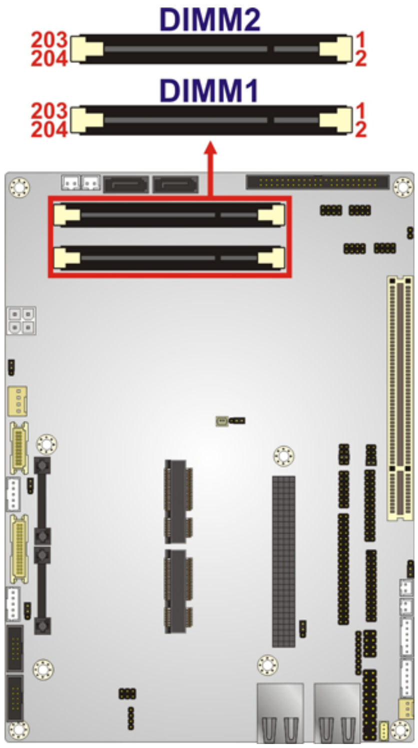


Figure 3-6: SO-DIMM Connector Locations

3.2.5 Digital I/O Connector

CN Label: **DIO1**

CN Type: 26-pin header (2x13)

CN Location: See **Figure 3-7**

CN Pinouts: See **Table 3-6**

The digital I/O connector provides programmable input and output for external devices. The digital I/O provides 12-bit output and 12-bit input.

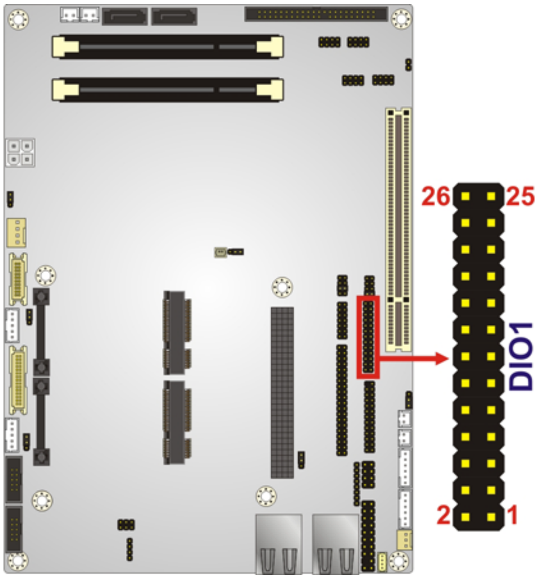


Figure 3-7: Digital I/O Connector Location

Pin	Description	Pin	Description
1	GND	2	VCC (+5V)
3	IN0	4	OUT0
5	IN1	6	OUT1
7	IN2	8	OUT2
9	IN3	10	OUT3
11	8IN0	12	8OUT0
13	8IN1	14	8OUT1
15	8IN2	16	8OUT2
17	8IN3	18	8OUT3
19	8IN4	20	8OUT4
21	8IN5	22	8OUT5
23	8IN6	24	8OUT6
25	8IN7	26	8OUT7

Table 3-6: Digital I/O Connector Pinouts

3.2.6 Digital I/O Programming Port

CN Label: **P_DIO_1**

CN Type: 8-pin header (1x8)

CN Location: See **Figure 3-8**

CN Pinouts: See **Table 3-7**

Used for programming the LC4064 chip connected to connector DIO1.

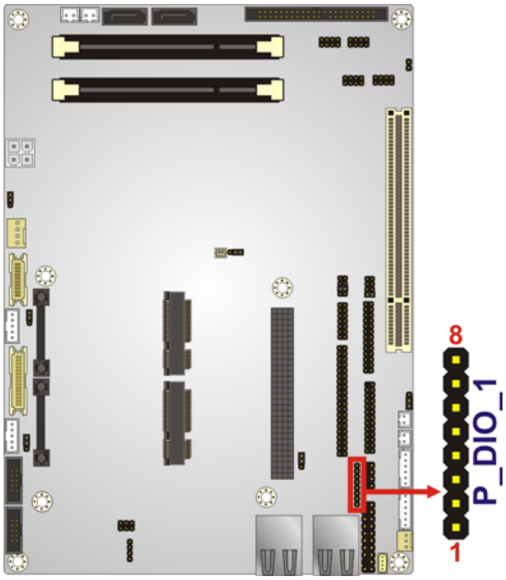


Figure 3-8: Programming Port Location

Pin	Description	Pin	Description
1	3.3V	2	D_TDO
3	D_TDI	4	NC
5	NC	6	D_TMS
7	GND	8	D_TCK

Table 3-7: Programming Port Pinouts

3.2.7 Fan Connector (CPU)

CN Label: **CPU_FAN1**

CN Type: 4-pin wafer (1x4)

CN Location: See **Figure 3-9**

CN Pinouts: See **Table 3-8**

The fan connector attaches to a CPU cooling fan.

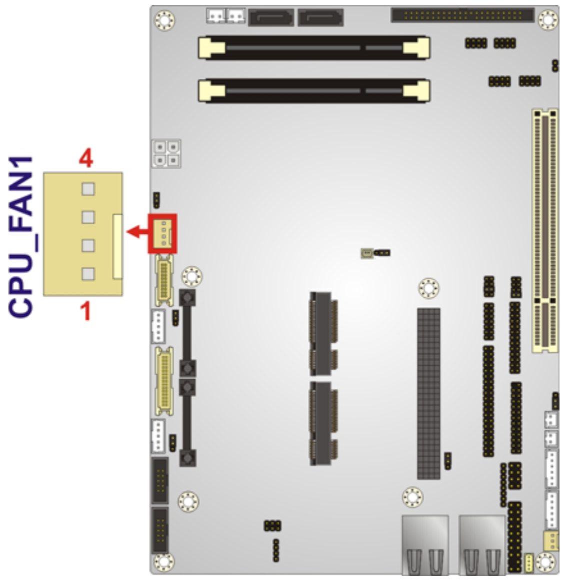


Figure 3-9: CPU Fan Connector Location

Pin	Description
1	GROUND
2	+12V
3	CPUFANIN
4	CPUFANOUT

Table 3-8: CPU Fan Connector Pinouts

3.2.8 Fan Connector (System)

CN Label: **FAN2**

CN Type: 3-pin wafer (1x3)

CN Location: See **Figure 3-10**

CN Pinouts: See **Table 3-9**

The cooling fan connector provides a 12V, 500mA current to the cooling fan.

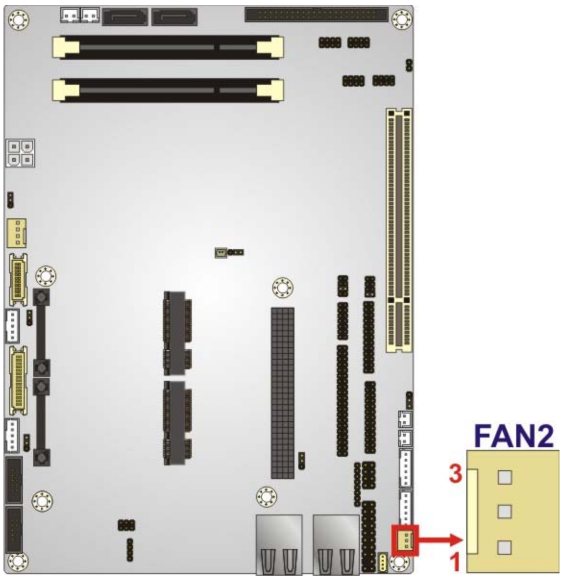


Figure 3-10: +12V Fan Connector Locations

Pin	Description
1	SYSFANIN0
2	+12V
3	GND

Table 3-9: +12V Fan Connector Pinouts

3.2.9 Front Panel Connector

CN Label: **CN2**

CN Type: 6-pin wafer (1x6)

CN Location: See **Figure 3-11**

CN Pinouts: See **Table 3-10**

The connector connects to the hard drive activity LED and power LED on the system front panel. +5 V power output is also provided via this connector.

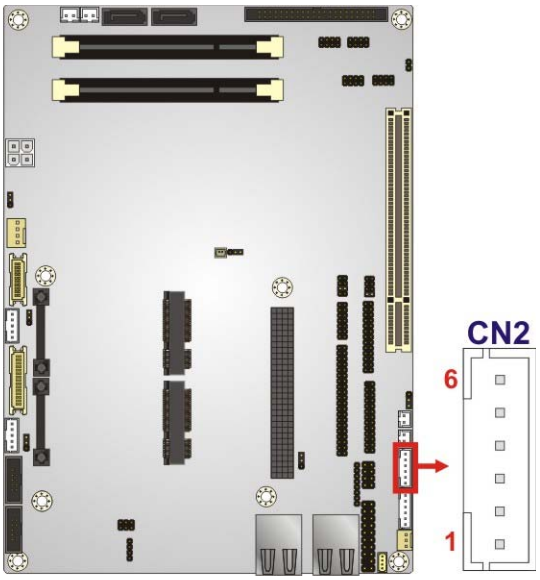


Figure 3-11: Front Panel Connector Location

Pin	Description
1	VCC
2	GND
3	PWR_LED+
4	PWR_LED-
5	HDD_LED+
6	HDD_LED-

Table 3-10: Front Panel Connector Pinouts

3.2.10 IDE Connector

CN Label: **IDE1**

CN Type: 44-pin box header (2x22)

CN Location: See **Figure 3-12**

CN Pinouts: See **Table 3-11**

The IDE connector can connect to an IDE hard drive or optical device.

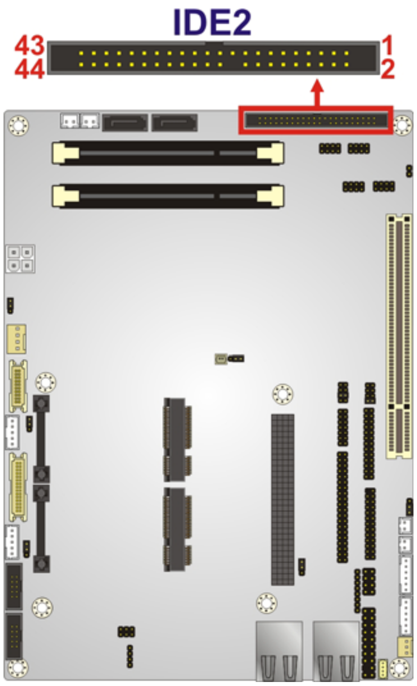


Figure 3-12: IDE Connector Location

Pin	Description	Pin	Description
1	RESET#	2	GND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GND	20	N/C
21	IDE DRQ	22	GND

Pin	Description	Pin	Description
23	IOW#	24	GND
25	IOR#	26	GND
27	IDE CHRDY	28	BALE – DEFAULT
29	IDE DACK	30	GND
31	INTERRUPT	32	N/C
33	SA1	34	PDIAG#
35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#
39	HDD ACTIVE#	40	GND
41	VCC	42	VCC
43	GND	44	N/C

Table 3-11: IDE Connector Pinouts

3.2.11 Keyboard/Mouse Connector

CN Label: **KB/MS1**

CN Type: 6-pin wafer (1x6)

CN Location: See **Figure 3-13**

CN Pinouts: See **Table 3-12**

The keyboard/mouse connector connects to a PS/2 Y-cable that can be connected to a PS/2 keyboard and mouse.

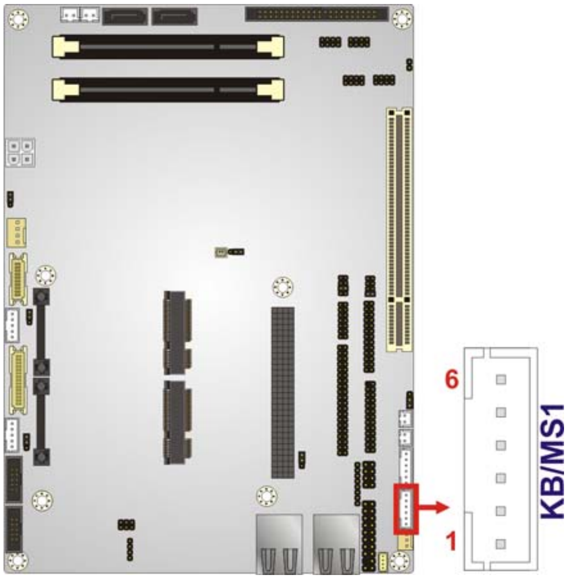


Figure 3-13: Keyboard/Mouse Connector Location

Pin	Description
1	+5 VCC
2	MS DATA
3	MS CLK
4	KB DATA
5	KB CLK
6	GROUND

Table 3-12: Keyboard/Mouse Connector Pinouts

3.2.12 Backlight Inverter Connectors

CN Label: **INVERTER1, INVERTER2**

CN Type: 5-pin wafer (1x5)

CN Location: See **Figure 3-14**

CN Pinouts: See **Table 3-13**

The backlight inverter connector provides power to an LCD panel. The **INVERTER1** connector provides power to the LCD panel connected to **LVDS2** while the **INVERTER2** provides power to the LCD panel connected to **LVDS3**.

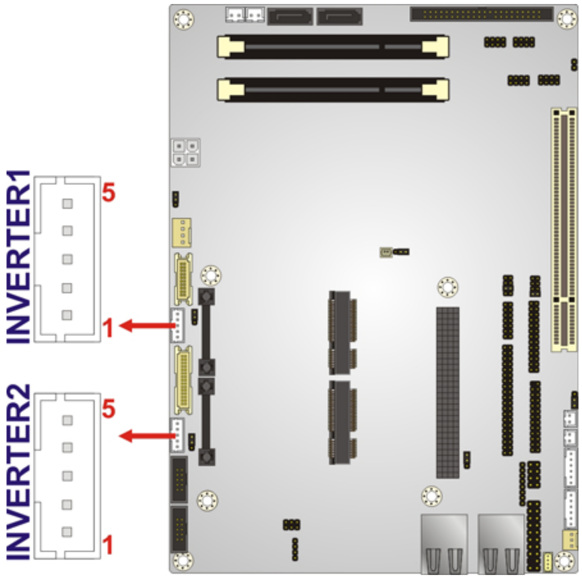


Figure 3-14: Backlight Inverter Connector Locations

Pin	Description
1	BRIGHTNESS
2	GROUND1
3	+12 V
4	GROUND2
5	BACKLIGHT ENABLE

Table 3-13: Backlight Inverter Connector Pinouts

3.2.13 LVDS LCD Connector (18/24-bit Dual-channel)

CN Label: **LVDS2**

CN Type: 30-pin crimp (2x15)

CN Location: See **Figure 3-15**

CN Pinouts: See **Table 3-14**

The LVDS connector is for an LCD panel connected to the board.

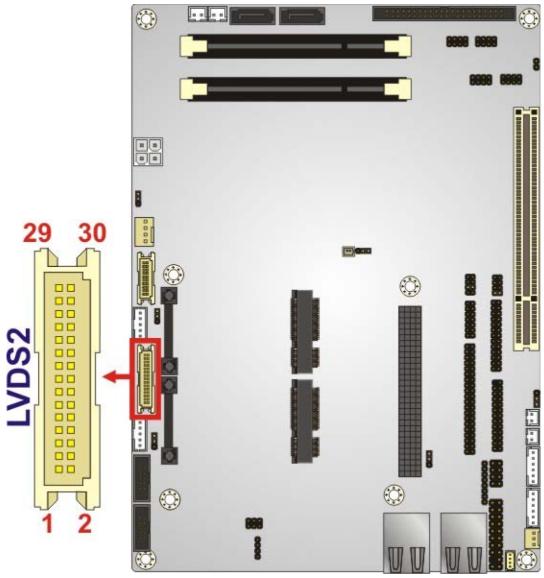


Figure 3-15: LVDS2 Connector Location

Pin	Description	Pin	Description
1	GND	2	GND
3	LVDS_DAP0	4	LVDS_DAN0
5	LVDS_DAP1	6	LVDS_DAN1
7	LVDS_DAP2	8	LVDS_DAN2
9	LVDS_CLKA	10	LVDS_CLKA#
11	LVDS_DAP3	12	LVDS_DAN3
13	GND	14	GND
15	LVDS_DBP0	16	LVDS_DBN0
17	LVDS_DBP1	18	LVDS_DBN1
19	LVDS_DBP2	20	LVDS_DBN2
21	LVDS_CLKB	22	LVDS_CLKA#
23	LVDS_DBP3	24	LVDS_DBN3
25	GND	26	GND
27	VCC_LCD	28	VCC_LCD
29	VCC_LCD	30	VCC_LCD

Table 3-14: LVDS2 Connector Pinouts

3.2.14 LVDS LCD Connector (18-bit Single-channel)

CN Label: **LVDS3**

CN Type: 20-pin crimp (2x10)

CN Location: See **Figure 3-16**

CN Pinouts: See **Table 3-15**

The LVDS connector is for an LCD panel connected to the board.

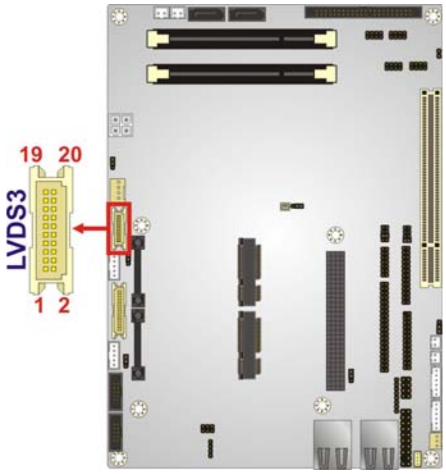


Figure 3-16: LVDS3 Connector Location

Pin	Description	Pin	Description
1	GND	2	GND
3	LVDS_DAP0	4	LVDS_DAN0
5	LVDS_DAP1	6	LVDS_DAN1
7	LVDS_DAP2	8	LVDS_DAN2
9	LVDS_CLKA	10	LVDS_CLKA#
11	NC	12	NC
13	GND	14	GND
15	Rev(DDC_DAT)	16	Rev(DDC_CLK)
17	VCC_LCD	18	VCC_LCD
19	VCC_LCD	20	VCC_LCD

Table 3-15: LVDS3 Connector Pinouts

3.2.15 Parallel Port Connector

CN Label: **LPT1**

CN Type: 26-pin header (2x13)

CN Location: See **Figure 3-17**

CN Pinouts: See **Table 3-16**

The parallel port connector connects to a parallel port connector interface or some other parallel port device such as a printer.

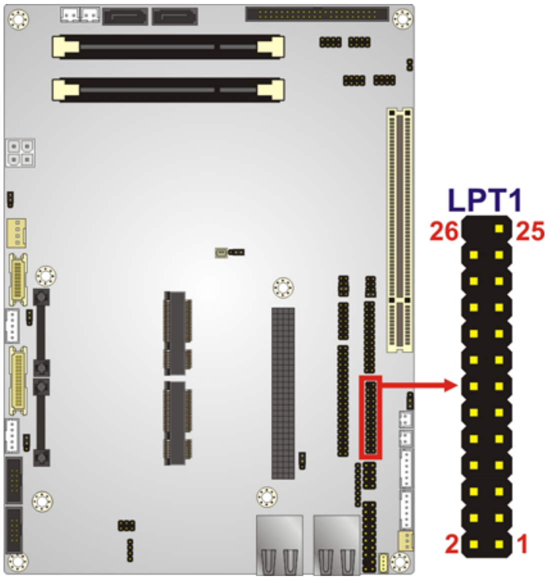


Figure 3-17: Parallel Port Connector Location

Pin	Description	Pin	Description
1	STROBE#	14	AUTO FORM FEED #
2	DATA0	15	ERROR#
3	DATA1	16	INITIALIZE#
4	DATA2	17	PRINTER SELECT LN#
5	DATA3	18	GND
6	DATA4	19	GND
7	DATA5	20	GND
8	DATA6	21	GND
9	DATA7	22	GND
10	ACKNOWLEDGE#	23	GND

Pin	Description	Pin	Description
11	BUSY	24	GND
12	PAPER EMPTY	25	GND
13	PRINTER SELECT	26	N/C

Table 3-16: Parallel Port Connector Pinouts

3.2.16 PCI-104 Connector

CN Label: **PCI104_PLUS3**

CN Type: PCI-104 connector

CN Location: See **Figure 3-18**

CN Pinouts: See **Table 3-17**

The PCI-104 connector is for installing a PCI-104 expansion card.

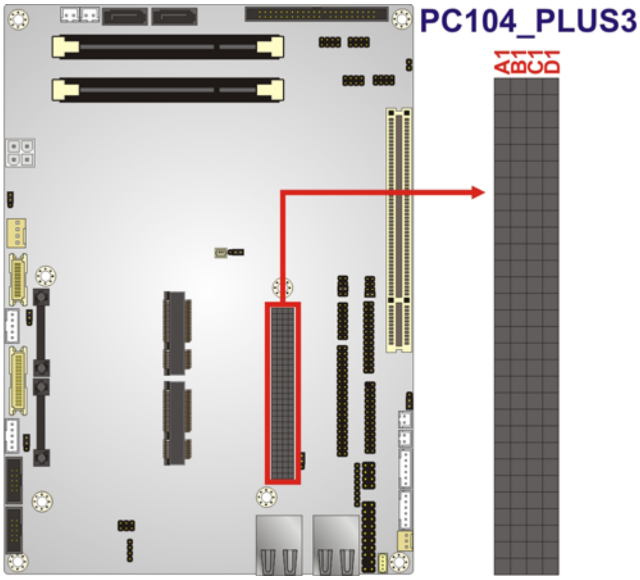


Figure 3-18: PCI-104 Connector Location

Pin	Row A	Row B	Row C	Row D
1	GND	RESERVED1	+5V	AD0
2	VIO1	AD2	AD1	+5V
3	AD5	GND	AD4	AD3
4	CBE0-	AD7	GND	AD6

Pin	Row A	Row B	Row C	Row D
5	GND	AD9	AD8	GND
6	AD11	VIO2	AD10	M66EN
7	AD14	AD13	GND	AD12
8	+3V	CBE1-	AD15	+3V
9	SERR-	GND	SBO-	PAR
10	GND	PERR-	+3V	SDONE
11	STOP-	+3V	LOCK-	GND
12	+3V	TRDY-	GND	DEVSEL-
13	FRAME-	GND	IRDY-	+3V
14	GND	AD16	+3V	CBE2-
15	AD18	+3V	AD17	GND
16	AD21	AD20	GND	AD19
17	+3V	AD23	AD22	+3V
18	IDSEL0	GND	IDSEL1-	IDSEL2
19	AD24	CBE3-	VIO4	IDSEL3
20	GND	AD26	AD25	GND
21	AD29	+5V	AD28	AD27
22	+5V	AD30	GND	AD31
23	REQ0-	GND	REQ1-	VIO5
24	GND	REQ2-	+5V	GNT0-
25	GNT1-	VIO3	GNT2-	GND
26	+5V	PCICLK0	GND	PCICLK1
27	PCICLK2	+5V	PCICLK3	GND
28	GND	INTD-	+5V	PCIRST-
29	+12V	INTA-	INTB-	INTC-
30	-12V	RESERVED2	RESERVED3	GND

Table 3-17: PCI-104 Connector Pinouts

3.2.17 PCI Slot

CN Label: **PCI1**

CN Type: PCI Slot

CN Location: See **Figure 3-19**

CN Pinouts: See **Table 3-18**

The PCI slot enables a PCI expansion module to be connected to the board.

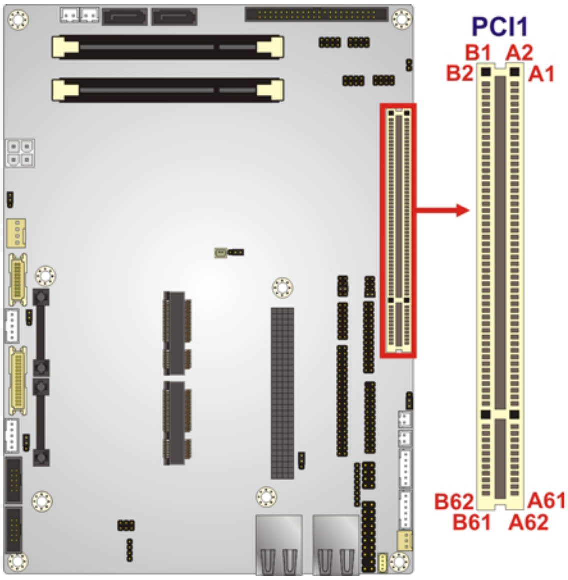


Figure 3-19: PCI Slot Location

Pin	Description	Pin	Description
A1	TRST	B1	-12 V
A2	+12 V	B2	TCK
A3	TMS	B3	GND
A4	TDI	B4	TDO
A5	+5 V	B5	+5 V
A6	INTA	B6	+5 V
A7	INTC	B7	INTB
A8	+5 V	B8	INTD
A9	RESERVED3	B9	PRSNT1
A10	+5 V	B10	RESERVED1
A11	RESERVED4	B11	PRSNT2
A12	GND	B12	GND
A13	GND	B13	GND
A14	3.3 V_AUX	B14	RESERVED2

Pin	Description	Pin	Description
A15	RST	B15	GND
A16	+5 V	B16	CLK
A17	GNT	B17	GND
A18	GND	B18	REQ
A19	PME	B19	+5 V
A20	AD30	B20	AD31
A21	+3.3 V	B21	AD29
A22	AD28	B22	GND
A23	AD26	B23	AD27
A24	GND	B24	AD25
A25	AD24	B25	+3.3 V
A26	IDSEL	B26	C/BE3
A27	+3.3 V	B27	AD23
A28	AD22	B28	GND
A29	AD20	B29	AD21
A30	GND	B30	AD19
A31	AD18	B31	+3.3 V
A32	AD16	B32	AD17
A33	+3.3 V	B33	C/BE2
A34	FRAME	B34	GND
A35	GND	B35	IRDY
A36	TRDY	B36	+3.3 V
A37	GND	B37	DEVSEL
A38	STOP	B38	GND
A39	+3.3 V	B39	LOCK
A40	SDONE	B40	PERR
A41	SBO	B41	+3.3 V
A42	GND	B42	SERR
A43	PAR	B43	+3.3 V
A44	AD15	B44	C/BE1
A45	+3.3 V	B45	AD14
A46	AD13	B46	GND

Pin	Description	Pin	Description
A47	AD11	B47	AD12
A48	GND	B48	AD10
A49	AD9	B49	GND
A52	C/BE0	B52	AD8
A53	+3.3 V	B53	AD7
A54	AD6	B54	+3.3 V
A55	AD4	B55	AD5
A56	GND	B56	AD3
A57	AD2	B57	GND
A68	AD0	B68	AD1
A59	+5 V	B59	+5 V
A60	REQ64	B60	ACK64
A61	+5 V	B61	+5 V
A62	+5 V	B62	+5 V

Table 3-18: PCI Slot

3.2.18 PCIe Mini Card Slots

CN Label: **MINI-PCIE1, MINI-PCIE2**

CN Type: PCIe Mini card slot

CN Location: See **Figure 3-20**

CN Pinouts: See **Table 3-19**

The PCIe Mini card slot is for installing PCIe Mini expansion cards. The MINI-PCIE1 is for installing IEI Mini DOM.

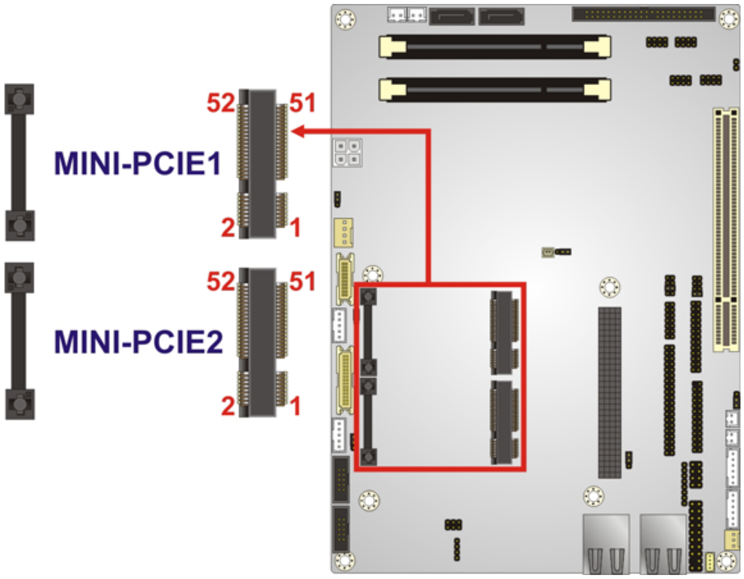


Figure 3-20: PCIe Mini Card Slot Locations

Pin	Description	Pin	Description
1	PCIE_WAKE#	2	VCC3
3	N/C	4	GND
5	N/C	6	1.5V
7	N/C	8	N/C
9	GND	10	N/C
11	CLK-	12	N/C
13	CLK+	14	N/C
15	GND	16	N/C
17	PCIRST#	18	GND
19	N/C	20	VCC3
21	GND	22	PCIRST#
23	PERN2	24	3VDual
25	PERP2	26	GND
27	GND	28	1.5V
29	GND	30	SMBCLK
31	PETN2	32	SMBDATA
33	PETP2	34	GND
35	GND	36	USBD-
37	GND	38	USBD+

Pin	Description	Pin	Description
39	+3.3Vaux	40	GND
41	+3.3Vaux	42	N/C
43	GND	44	N/C
45	SATA_RX(A+	46	N/C
47	SATA_RX(A-)	48	NC
49	SATA_TX(B-)	50	GND
51	SATA_TX(B+)	52	+3.3Vaux

Table 3-19: PCIe Mini Card Slot Pinouts (MINI-PCIE1)

Pin	Description	Pin	Description
1	PCIE_WAKE#	2	VCC3
3	N/C	4	GND
5	N/C	6	1.5V
7	N/C	8	N/C
9	GND	10	N/C
11	CLK-	12	N/C
13	CLK+	14	N/C
15	GND	16	N/C
17	PCIRST#	18	GND
19	N/C	20	VCC3
21	GND	22	PCIRST#
23	PERN2	24	3VDual
25	PERP2	26	GND
27	GND	28	1.5V
29	GND	30	SMBCLK
31	PETN2	32	SMBDATA
33	PETP2	34	GND
35	GND	36	USBD-
37	N/C	38	USBD+
39	N/C	40	GND
41	N/C	42	N/C
43	N/C	44	N/C

Pin	Description	Pin	Description
45	N/C	46	N/C
47	N/C	48	1.5V
49	N/C	50	GND
51	N/C	52	VCC3

Table 3-20: PCIe Mini Card Slot Pinouts (MINI-PCIE2)

3.2.19 Power Connector (+12V)

CN Label: **PWRIN1**

CN Type: 4-pin Molex power connector (2x2)

CN Location: See **Figure 3-21**

CN Pinouts: See **Table 3-21**

The connector supports the 12V power supply.

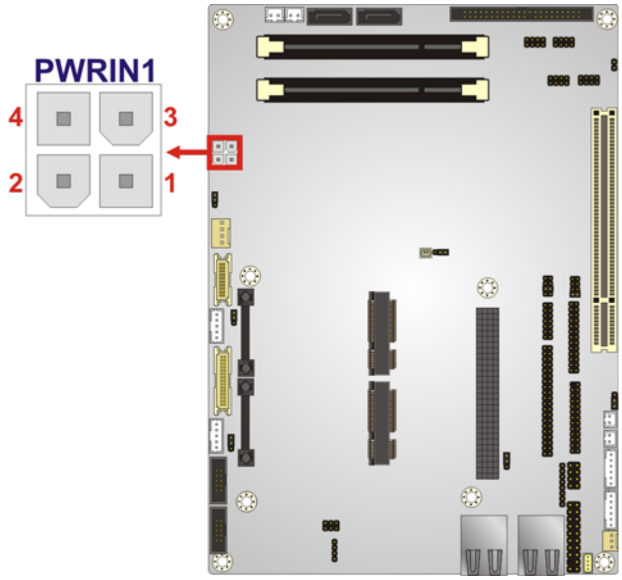


Figure 3-21: CPU 12V Power Connector Location

Pin	Description	Pin	Description
1	GND	2	GND
3	+12V	4	+12V

Table 3-21: CPU 12V Power Connector Pinouts

3.2.20 Power Button Connector

CN Label: **PWR_BTN1**

CN Type: 2-pin wafer (1x2)

CN Location: See **Figure 3-22**

CN Pinouts: See **Table 3-22**

The power button connector is connected to a power switch on the system chassis.

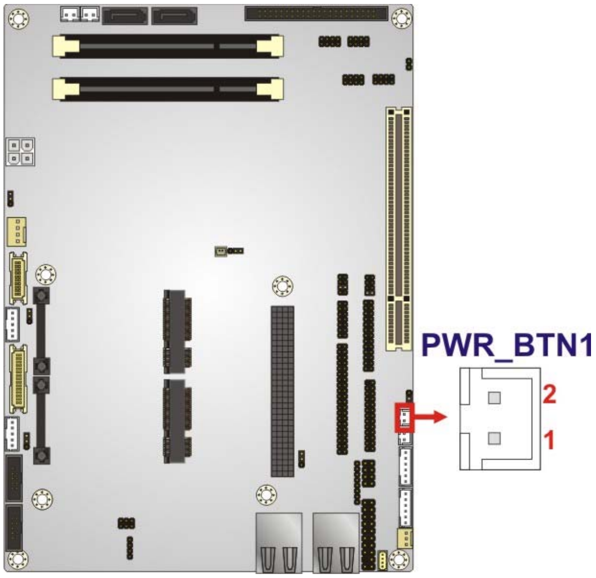


Figure 3-22: Power Button Connector Location

Pin	Description
1	PWRBTN# signal
2	GND

Table 3-22: Power Button Connector Pinouts

3.2.21 Reset Button Connector

CN Label: **RST_BTN1**

CN Type: 2-pin wafer (1x2)

CN Location: See **Figure 3-23**

CN Pinouts: See **Table 3-23**

The reset button connector is connected to a reset switch on the system chassis.

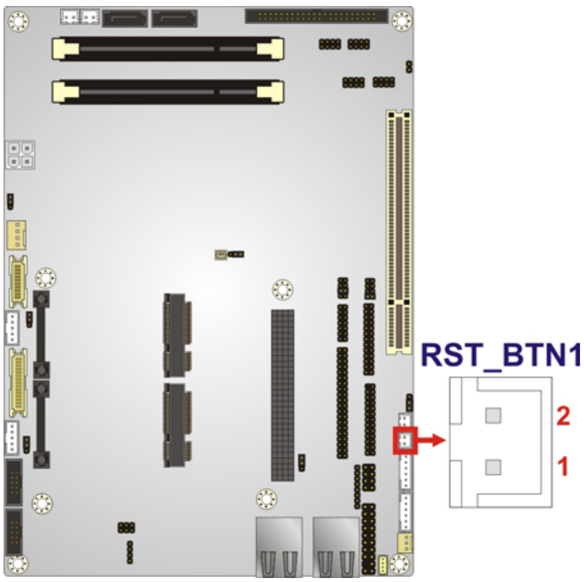


Figure 3-23: Reset Button Connector Location

Pin	Description
1	RESET# signal
2	GND

Table 3-23: Reset Button Connector Pinouts

3.2.22 SATA Drive Connectors

CN Label: **SATA1**, **SATA2**

CN Type: 7-pin SATA drive connectors

CN Location: See **Figure 3-24**

CN Pinouts: See **Table 3-24**

The two SATA 3Gb/s drive connectors are each connected to a SATA 3Gb/s drive. The SATA 3Gb/s drives transfer data at speeds as high as 3.0 Gb/s.

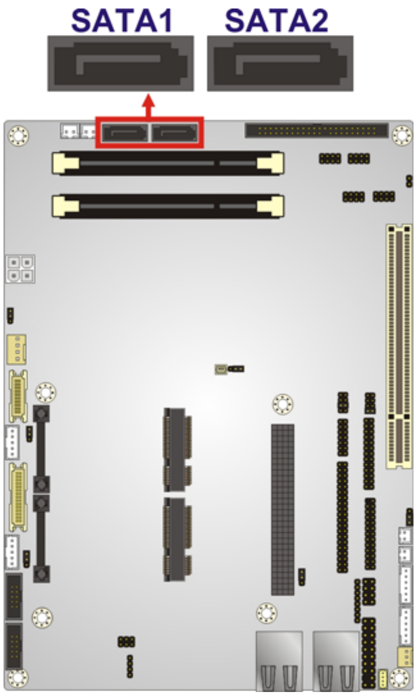


Figure 3-24: SATA Drive Connector Locations

Pin	Description
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

Table 3-24: SATA Drive Connector Pinouts

3.2.23 SATA Power Connectors

CN Label: **SATA_PWR1**, **SATA_PWR2**

CN Type: 2-pin wafer (1x2)

CN Location: See **Figure 3-25**

CN Pinouts: See **Table 3-25**

The SATA Power Connectors provides +5V power output to the SATA connectors.

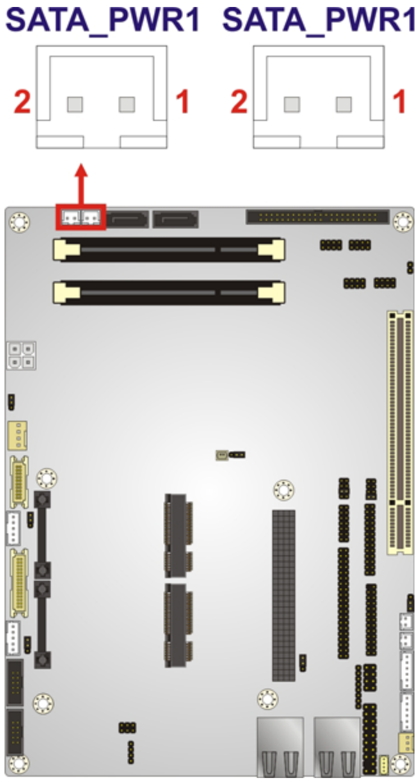


Figure 3-25: SATA Power Connector Locations

Pin	Description
1	+5V
2	GND

Table 3-25: SATA Power Connector Pinouts

3.2.24 Serial Port Connector (RS-232)

CN Label: **COM1**

CN Type: 40-pin header (2x20)

CN Location: See **Figure 3-26**

CN Pinouts: See **Table 3-26**

This connector provides RS-232 connections for four serial ports.

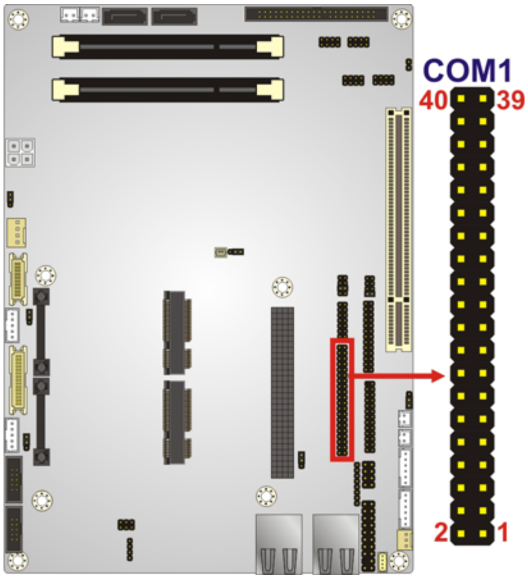


Figure 3-26: COM Connector Locations

Pin	Description	Pin	Description
1	DATA CARRIER DETECT (DCD1#)	2	DATA SET READY (DSR1#)
3	RECEIVE DATA (RXD1)	4	REQUEST TO SEND (RTS1#)
5	TRANSMIT DATA (TXD1)	6	CLEAR TO SEND (CTS1#)
7	DATA TERMINAL READY (DTR1#)	8	RING INDICATOR (RI1#)
9	GND	10	GND
11	DATA CARRIER DETECT (DCD2#)	12	DATA SET READY (DSR2#)
13	RECEIVE DATA (RXD2)	14	REQUEST TO SEND (RTS2#)
15	TRANSMIT DATA (TXD2)	16	CLEAR TO SEND (CTS2#)
17	DATA TERMINAL READY (DTR2#)	18	RING INDICATOR (RI2#)
19	GND	20	GND
21	DATA CARRIER DETECT (DCD3#)	22	DATA SET READY (DSR3#)
23	RECEIVE DATA (RXD3)	24	REQUEST TO SEND (RTS3#)
25	TRANSMIT DATA (TXD3)	26	CLEAR TO SEND (CTS3#)
27	DATA TERMINAL READY (DTR3#)	28	RING INDICATOR (RI3#)
29	GND	30	GND
31	DATA CARRIER DETECT (DCD4#)	32	DATA SET READY (DSR4#)
33	RECEIVE DATA (RXD4)	34	REQUEST TO SEND (RTS4#)

Pin	Description	Pin	Description
35	TRANSMIT DATA (TXD4)	36	CLEAR TO SEND (CTS4#)
37	DATA TERMINAL READY (DTR4#)	38	RING INDICATOR (RI4#)
39	GND	40	GND

Table 3-26: Serial Port Connector Pinouts

3.2.25 Serial Port Connector (RS-232/422/485)

CN Label: **COM6**

CN Type: 14-pin header (2x7)

CN Location: See **Figure 3-27**

CN Pinouts: See **Table 3-27**

Used for RS-232/422/485 communications.

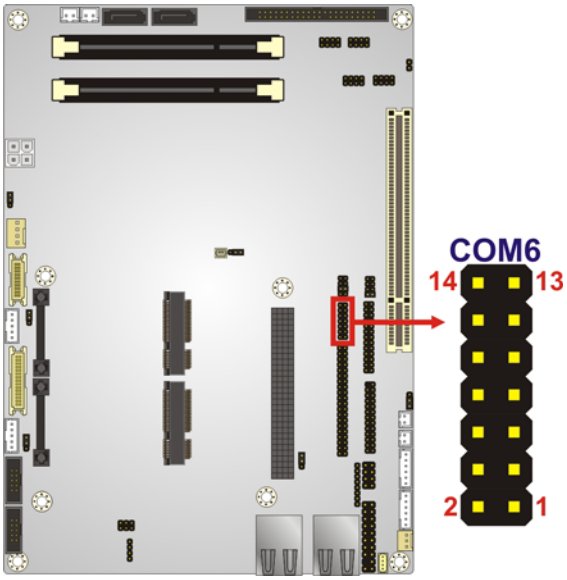


Figure 3-27: Serial Port Connector Location

Pin	DESCRIPTION	Pin	DESCRIPTION
1	DATA CARRIER DETECT (DCD#)	2	DATA SET READY (DSR#)
3	RECEIVE DATA (RXD)	4	REQUEST TO SEND (RTS#)
5	TRANSMIT DATA (TXD)	6	CLEAR TO SEND (CTS#)
7	DATA TERMINAL READY (DTR#)	8	RING INDICATOR (RI#)

Pin	DESCRIPTION	Pin	DESCRIPTION
9	GND	10	GND
11	TXD422+/TXD485+	12	TXD422-/TXD485-
13	RXD422+	14	RXD422-

Table 3-27: Serial Port Connector Pinouts

3.2.26 SMBus Connector

CN Label: **CN3**

CN Type: 4-pin wafer (1x4)

CN Location: See **Figure 3-28**

CN Pinouts: See **Table 3-28**

The SMBus (System Management Bus) connector provides low-speed system management communications.

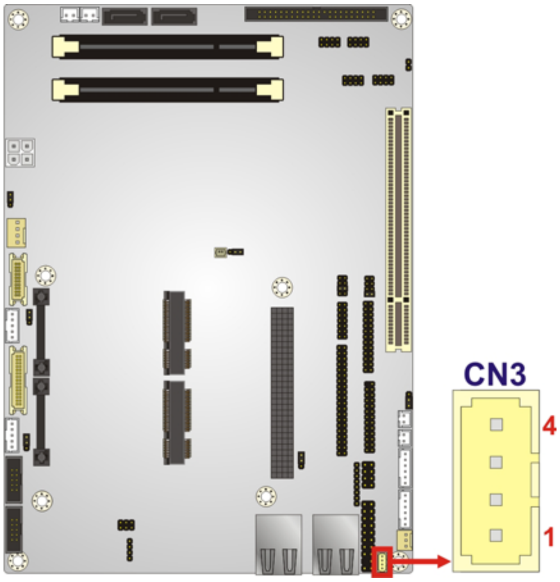


Figure 3-28: SMBus Connector Location

Pin	Description
1	GND
2	SMB_DATA

Pin	Description
3	SMB_CLK
4	+5V

Table 3-28: SMBus Connector Pinouts

3.2.27 SPI Flash Connector

CN Label: **JSPI1**

CN Type: 8-pin wafer (2x4)

CN Location: See **Figure 3-29**

CN Pinouts: See **Table 3-29**

The 8-pin SPI Flash connector is used to flash the BIOS.

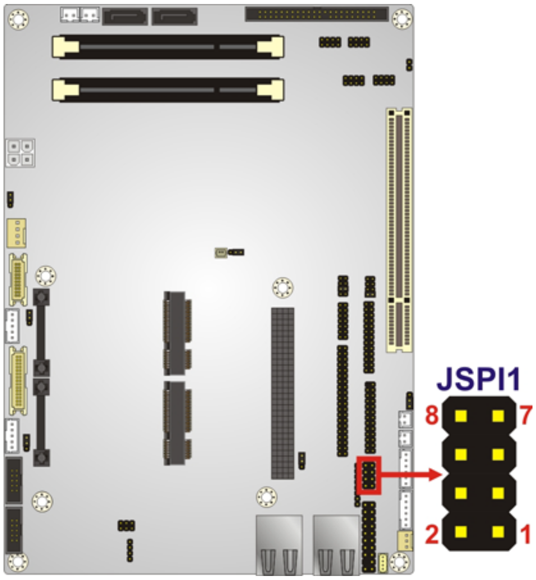


Figure 3-29: SPI Flash Connector Location

Pin	Description	Pin	Description
1	SPI_VCC (+5V)	2	GND
3	SPI_CS#0	4	SPI_CLK
5	SPI_SO0	6	SPI_SI
7	N/C	8	N/C

Table 3-29: SPI Flash Connector Pinouts

3.2.28 TPM Connector

CN Label: **TPM1**

CN Type: 20-pin header (2x10)

CN Location: See **Figure 3-30**

CN Pinouts: See **Table 3-30**

The Trusted Platform Module (TPM) connector secures the system on bootup.

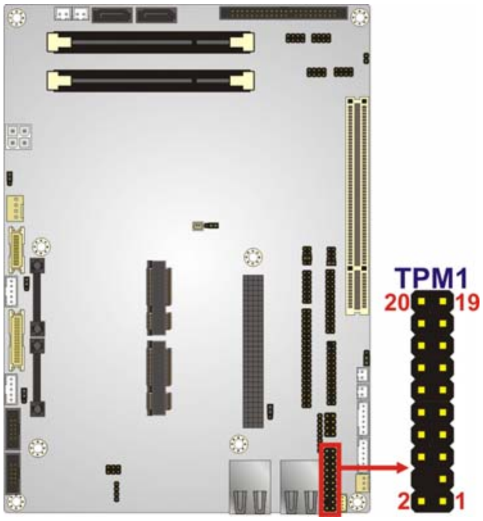


Figure 3-30: TPM Connector Pinout Location

Pin	Description	Pin	Description
1	FWHPCLK	2	GND
3	LFRAME#	4	NC (KEY)
5	PCIRST#	6	VCC (+5V)
7	LAD3	8	LAD2
9	VCC3 (+3.3V)	10	LAD1
11	LAD0	12	GND
13	SMBCLK	14	SMBDATA
15	3VDUAL	16	SERIRQ
17	GND	18	CLKRUN#
19	LPCPD#	20	LDRQ#

Table 3-30: TPM Connector Pinouts

3.2.29 USB Connectors

CN Label: **USB1**, **USB2**, **USB3**, **USB4**

CN Type: 8-pin header (2x4)

CN Location: See **Figure 3-31**

CN Pinouts: See **Table 3-31**

The USB connectors connect to USB devices. Each pin header provides two USB ports.

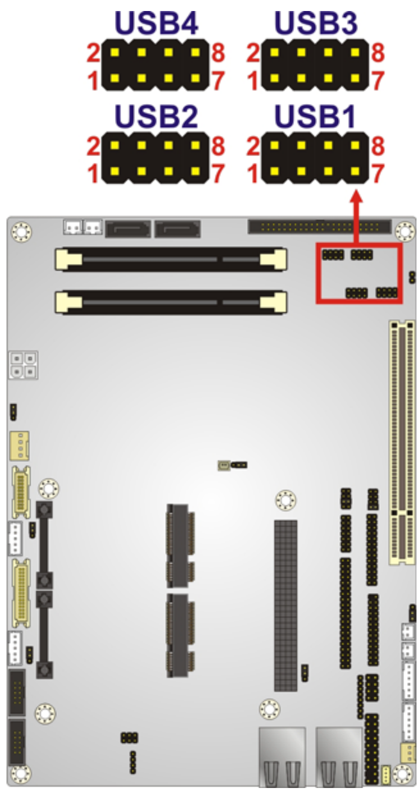


Figure 3-31: USB Connector Locations

Pin	Description	Pin	Description
1	VCC (+5V)	2	GND
3	DATA-	4	DATA+
5	DATA+	6	DATA-
7	GND	8	VCC (+5V)

Table 3-31: USB Port Connector Pinouts

3.2.30 VGA Connector (Internal)

CN Label: **VGA1**

CN Type: 10-pin box header (2x5)

CN Location: See **Figure 3-32**

CN Pinouts: See **Table 3-32**

The VGA connector connects to a monitor.

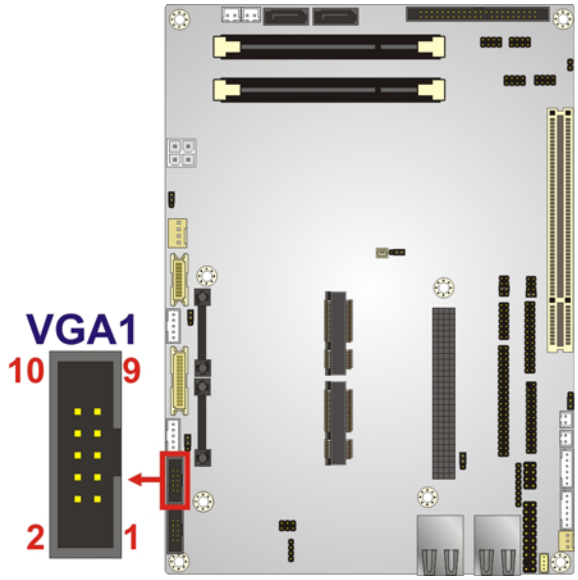


Figure 3-32: VGA Connector Location

Pin	Description	Pin	Description
1	RED	2	VDDCLK
3	GREEN	4	VDDCDA
5	BLUE	6	GND
7	HSYNC	8	GND
9	VSYNC	10	CRT_PLUG#

Table 3-32: VGA Connector Pinouts

3.3 External Peripheral Interface Connector Panel

The following diagrams show the NOVA-PV-D5251/D4251 external peripheral interface connector (EPIC) panel. The NOVA-PV-D5251/D4251 EPIC panel consists of the following:

- 2 x Ethernet connectors (G2L2 models)
- 4 x Ethernet connectors (G4 model)
- 1 x RS-232 serial port connector (G4 model)

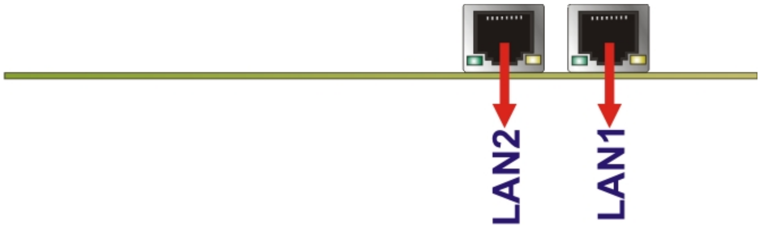


Figure 3-33: External Peripheral Interface Connector (G2L2 Models)

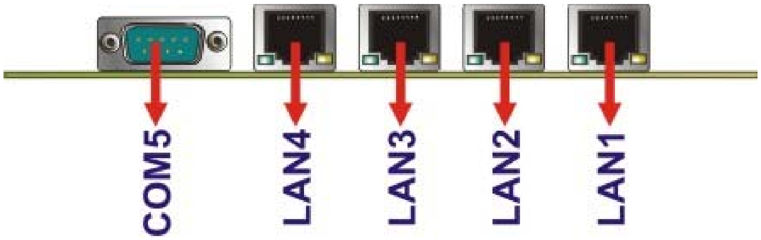


Figure 3-34: External Peripheral Interface Connector (G4 Models)

3.3.1 Ethernet Connector

CN Label: **LAN1, LAN2, (LAN3, LAN4)**

CN Type: RJ-45

CN Location: See **Figure 3-33**

CN Pinouts: See **Table 3-33**

The NOVA-PV-D5251/D4251 is equipped with two or four RJ-45 Ethernet controllers. Each controller can connect to the LAN through one RJ-45 LAN connector.

Pin	Description	Pin	Description
1	MDI0+	2	MDI0+
3	MDI1+	4	MDI1-
5	NC	6	NC
7	MDI2+	8	MDI2-
9	MDI3+	10	MDI3-

Table 3-33: LAN Pinouts

The RJ-45 Ethernet connector has two status LEDs, one green and one yellow. The green LED indicates activity on the port and the yellow LED indicates the speed. See **Table 3-34**.

Speed LED		Activity/Link LED	
STATUS	**DESCRIPTION**	**STATUS**	**DESCRIPTION**
Off	10 Mbps connection	Off	No link
Green	100 Mbps connection	Yellow	Linked
Orange	Gbps connection	Blinking	TX/RX activity 1

Table 3-34: RJ-45 Ethernet Connector LEDs



Figure 3-35: RJ-45 Ethernet Connector

3.3.2 Serial Port Connectors (G4 Model Only)

CN Label: **COM5**

CN Type: DB-9 connectors

CN Location: See **Figure 3-33**

CN Pinouts: See **Table 3-35** and **Figure 3-36**

The optional serial port connects to a RS-232 serial communications device.

Pin	Description	Pin	Description
1	DCD	6	DSR
2	RX	7	RTS
3	TX	8	CTS
4	DTR	9	RI
5	GND		

Table 3-35: Serial Port Pinouts

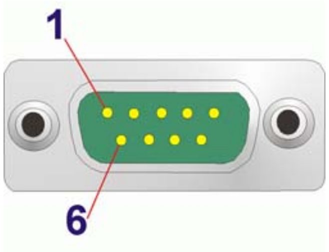


Figure 3-36: Serial Port Pinouts

Chapter

4

Installation

4.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during installation may result in permanent damage to the product and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the NOVA-PV-D5251/D4251. Dry climates are especially susceptible to ESD. It is therefore critical to strictly adhere to the following anti-static precautions whenever the NOVA-PV-D5251/D4251, or any other electrical component, is handled.

- ***Wear an anti-static wristband***: - Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***:- Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring the NOVA-PV-D5251/D4251, place it on an antic-static pad. This reduces the possibility of ESD damaging the NOVA-PV-D5251/D4251.
- ***Only handle the edges of the PCB***:-: When handling the PCB, hold it by the edges.

4.2 Installation Considerations

NOTE:

The following installation notices and installation considerations should be read and understood before the NOVA-PV-D5251/D4251 is installed. All installation notices pertaining to the installation of NOVA-PV-D5251/D4251 should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the NOVA-PV-D5251/D4251 and injury to the person installing the motherboard.

WARNING:

The installation instructions described in this manual should be carefully followed in order to prevent damage to the NOVA-PV-D5251/D4251, NOVA-PV-D5251/D4251 components and injury to the user.

Before and during the installation please **DO** the following:

- **Read the user manual**:
  - The user manual provides a complete description of the installation instructions and configuration options.
- **Wear an electrostatic discharge cuff (ESD)**:
  - Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
- **Place on an antistatic pad**:
  - When installing or configuring the motherboard, place it on an antistatic pad. This helps to prevent potential ESD damage.
- **Turn all power off**:
  - Make sure the product is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the NOVA-PV-D5251/D4251 **DO NOT:**

- **DO NOT** remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- **DO NOT** use the product before verifying all the cables and power connectors are properly connected.
- **DO NOT** allow screws to come in contact with the PCB circuit, connector pins, or its components.

4.3 SO-DIMM Installation

To install an SO-DIMM, please follow the steps below and refer to **Figure 4-1**.

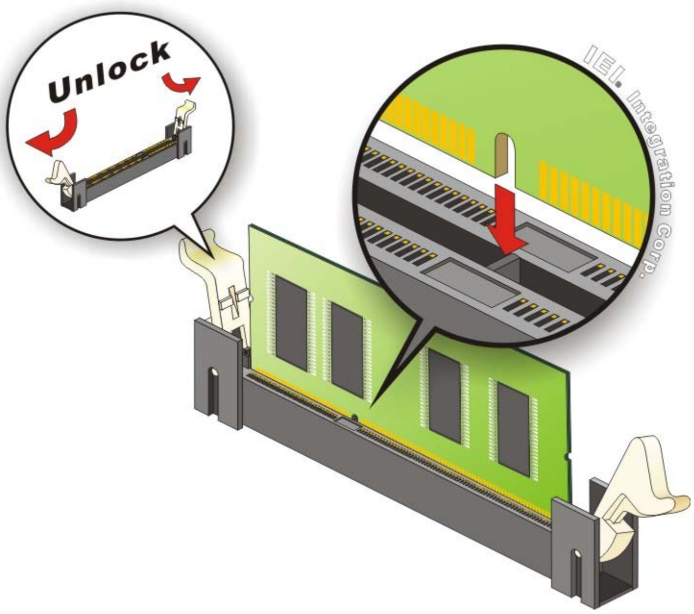


Figure 4-1: SO-DIMM Installation

Step 1: **Open the SO-DIMM socket handles**. Open the two handles outwards as far as they can. See **Figure 4-1**.

Step 2: **Align the SO-DIMM with the socket**. Align the SO-DIMM so the notch on the memory lines up with the notch on the memory socket. See **Figure 4-1**.

Step 3: **Insert the SO-DIMM**. Once aligned, press down until the SO-DIMM is properly seated. Clip the two handles into place. See **Figure 4-1**.

Step 4: **Removing a SO-DIMM**. To remove a SO-DIMM, push both handles outward. The memory module is ejected by a mechanism in the socket.

4.4 CompactFlash® Installation

NOTE:

Both CompactFlash® Type I and Type II cards are supported.

To install the CompactFlash® card, please follow the steps below.

Step 1: **Locate the CF card slot**.

Step 2: **Align the CF card**. Align the CompactFlash® card. The label side should be facing away from the board. The grooves on the CompactFlash® slot ensure that the card cannot be inserted the wrong way.

Step 3: **Insert the CF card**. Push until the CompactFlash® card is firmly seated in the slot. See Figure 4-2.

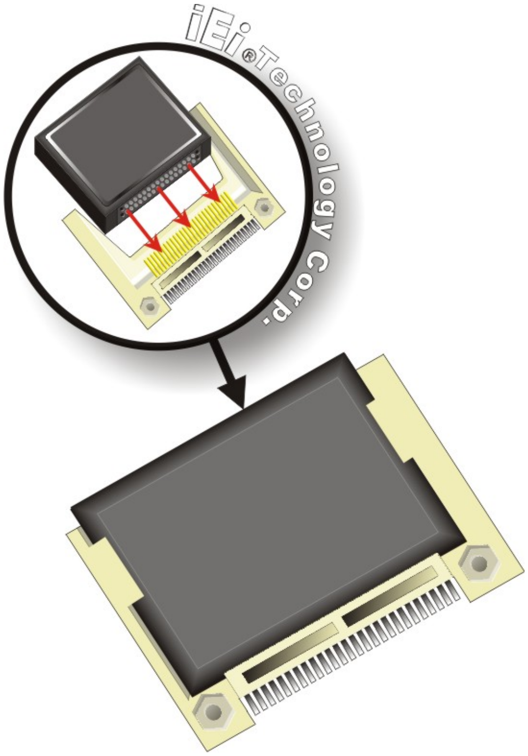


Figure 4-2: CompactFlash® Card Installation

4.5 Jumper Settings

NOTE:

A jumper is a metal bridge used to close an electrical circuit. It consists of two or three metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.

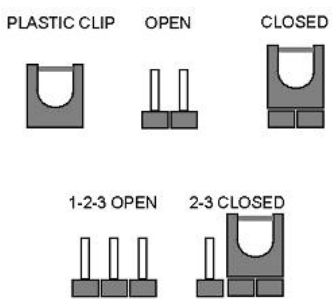


Figure 4-3: Jumper Locations

Before the NOVA-PV-D5251/D4251 is installed in the system, the jumpers must be set in accordance with the desired configuration. The jumpers on the NOVA-PV-D5251/D4251 are listed in **Table 4-1**.

Description	Type	Label
AT/ATX power mode setting	3-pin header	J_AUTOPWR1
Clear CMOS	3-pin header	J_CMOS1
COM6 RS-232/422/485 select	8-pin header	JP5
CompactFlash® setup	2-pin header	JCF1
CPU fan setting	3-pin header	JP7
LVDS2 LCD voltage select	3-pin header	J_VLVDS1
LVDS3 LCD voltage select	3-pin header	J_VLVDS2
LVDS2 panel resolution select	8-pin header	J_LCD_TYPE1
LVDS3 panel resolution select	6-pin header	JP10
PCI-104 and VIO voltage select	3-pin header	JP6

Table 4-1: Jumpers

4.5.1 AT/ATX Power Select

Jumper Label: **J_AUTOPWR1**

Jumper Type: 3-pin header (1x3)

Jumper Settings: See **Table 4-2**

Jumper Location: See **Figure 4-4**

The AT/ATX Power Select jumper specifies the systems power mode as AT or ATX. AT/ATX Power Select jumper settings are shown in **Table 4-2**.

Setting	Description
Short 1 - 2	Use ATX power (Default)
Short 2 – 3	Use AT power

Table 4-2: AT/ATX Power Select Jumper Settings

The location of the AT/ATX Power Select jumper is shown in **Figure 4-4** below.

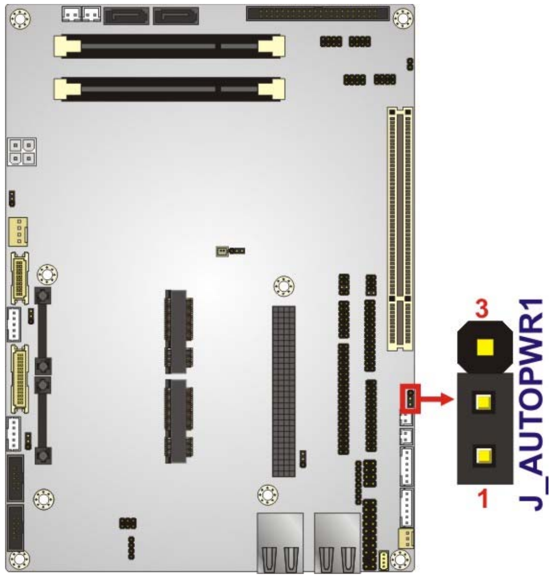


Figure 4-4: AT/ATX Power Select Jumper Location

4.5.2 Clear CMOS

Jumper Label:	**J_CMOS1**
Jumper Type:	3-pin header (1x3)
Jumper Settings:	See **Table 4-3**
Jumper Location:	See **Figure 4-5**

If the NOVA-PV-D5251/D4251 fails to boot due to improper BIOS settings, the clear CMOS jumper clears the CMOS data and resets the system BIOS information. To do this, use the jumper cap to close pins 2 and 3 for a few seconds then reinstall the jumper clip back to pins 1 and 2.

If the “CMOS Settings Wrong” message is displayed during the boot up process, the fault may be corrected by pressing the F1 to enter the CMOS Setup menu. Do one of the following:

- Enter the correct CMOS setting
- Load Optimal Defaults
- Load Failsafe Defaults.

After having done one of the above, save the changes and exit the CMOS Setup menu.

The clear CMOS jumper settings are shown in **Table 4-3**.

Setting	Description
Short 1 - 2	Keep CMOS Setup (Default)
Short 2 - 3	Clear CMOS Setup

Table 4-3: Clear CMOS Jumper Settings

The location of the clear CMOS jumper is shown in **Figure 4-5** below.

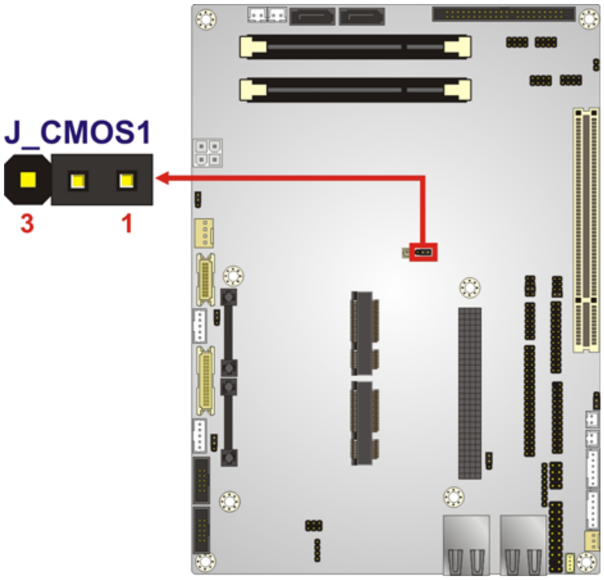


Figure 4-5: Clear CMOS Jumper

4.5.3 COM 6 Function Select

Jumper Label: **JP5**

Jumper Type: 8-pin header

Jumper Settings: See **Table 4-4**

Jumper Location: See **Figure 4-6**

The COM 6 Function Select jumper sets the communication protocol used by the third serial communications port (COM 6) as RS-232, RS-422 or RS-485. The COM 6 Function Select settings are shown in the table below.

Setting	Description
Short 1-2	RS-232 (Default)
Short 3-4	RS-422
Short 5-6	RS-485
Short 5-6, 7-8	RS-485 with RTS control

Table 4-4: COM 6 Function Select Jumper Settings

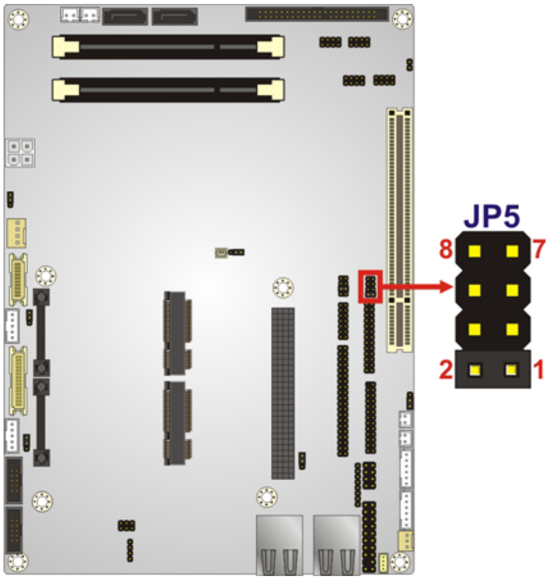


Figure 4-6: COM 6 Function Select Jumper Location

4.5.4 CompactFlash® Setup

Jumper Label: **JCF1**

Jumper Type: 2-pin header

Jumper Settings: See **Table 4-5**

Jumper Location: See **Figure 4-7**

The CompactFlash® slot is connected through an IDE connection. This jumper sets the CompactFlash® card as the master or slave IDE device.

Setting	Description
Open	Slave (Default)

Setting	Description
Short 1-2	Master

Table 4-5: CompactFlash® Setup Jumper Settings

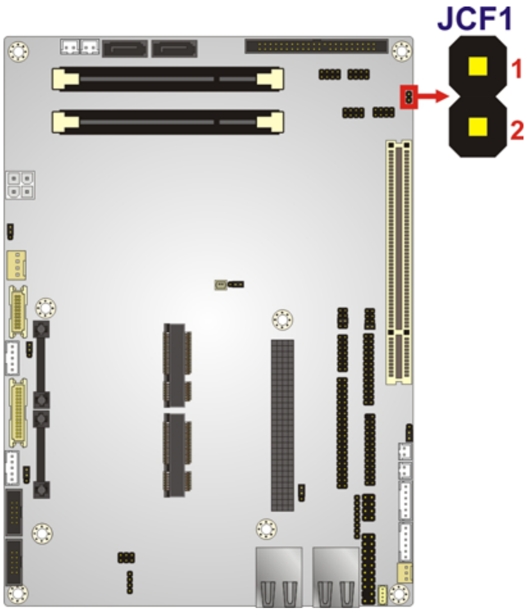


Figure 4-7: CompactFlash® Setup Jumper Location

4.5.5 CPU Fan Setting

Jumper Label: **JP7**

Jumper Type: 3-pin header

Jumper Settings: See **Table 4-6**

Jumper Location: See **Figure 4-8**

This jumper sets the 4-pin CPU fan connector (CPU_FAN1).

Setting	Description
Short 1-2	3-pin (Default)
Short 2-3	4-pin

Table 4-6: CPU Fan Setting Jumper Settings

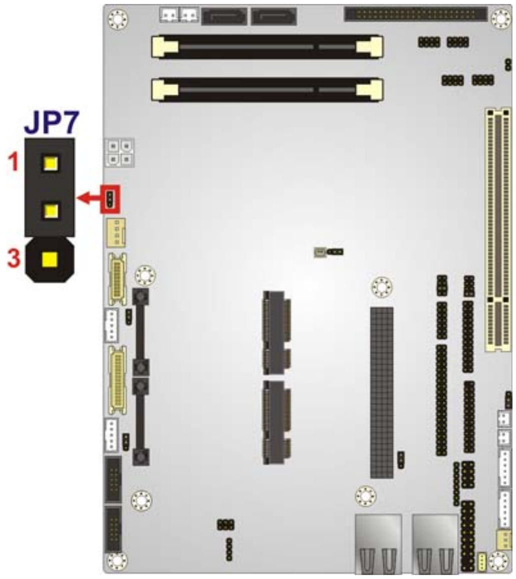


Figure 4-8: CPU Fan Setting Jumper Location

4.5.6 LVDS Voltage Select

WARNING:

Incorrect voltages can destroy the LCD panel. Make sure to select a voltage that matches the voltage required by the LCD panel.

Jumper Label:	**J_VLVDS1** for LVDS2
	J_VLVDS2 for LVDS3
Jumper Type:	3-pin header
Jumper Settings:	See **Table 4-7**
Jumper Location:	See **Figure 4-9**

The LCD voltage selection jumper sets the voltage of the power supplied to the LCD panel. The **J_VLVDS1** jumper sets the voltage connected to **LVDS2** while the **J_VLVDS2** jumper sets the voltage connected to **LVDS3**.

Setting	Description
Short 1-2	+5.0 V
Short 2-3	+3.3 V (Default)

Table 4-7: LVDS Voltage Selection Jumper Settings

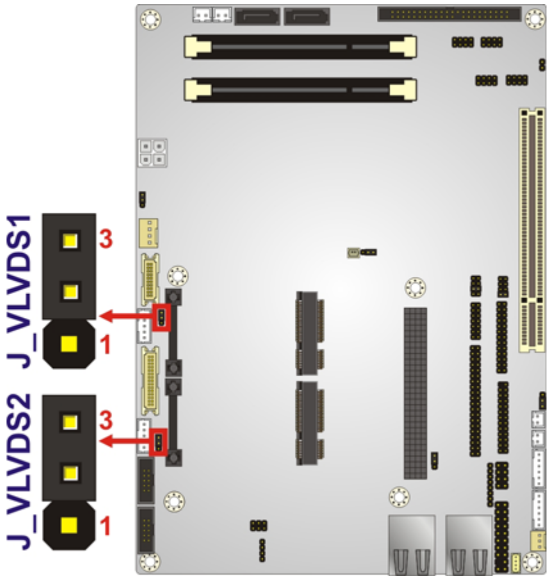


Figure 4-9: LVDS Voltage Selection Jumper Locations

4.5.7 LVDS Panel Resolution Select

Jumper Label: **J_LCD_TYPE1** for LVDS2

JP10 for LVDS3

Jumper Type: Pin header

Jumper Settings: See **Table 4-8** and **Table 4-9**

Jumper Location: See **Figure 4-10**

The LVDS Panel Resolution jumper configures the resolution of the LVDS output. The LVDS Panel Resolution jumper settings are shown in **Table 4-8** and **Table 4-9**.

J_LCD_TYPE1	Description
OFF	640 X 480 (18-bit)
Short 1-2	800 X 400 (18-bit)
Short 3-4	800 X 600 (18-bit) (Default)

J_LCD_TYPE1	Description
Short 1-2, 3-4	1024 X 768 (18-bit)
Short 5-6	1280 X 1024 (18-bit)
Short 1-2, 7-8	1366 X 768 (18-bit)
Short 1-2, 5-6, 7-8	1280 X 800 (18-bit)
Short 3-4, 5-6, 7-8	1280 X 600 (18-bit)

Table 4-8: LVDS1 Panel Resolution Jumper Settings

JP10	Description
Short 1-2	800 X 600
Short 3-4	1024 X 768
Short 1-2, 3-4	1280 X 1024
Short 5-6	1366 X 768
Short 1-2, 5-6	1920 x 1080

Table 4-9: LVDS2 Panel Resolution Jumper Settings

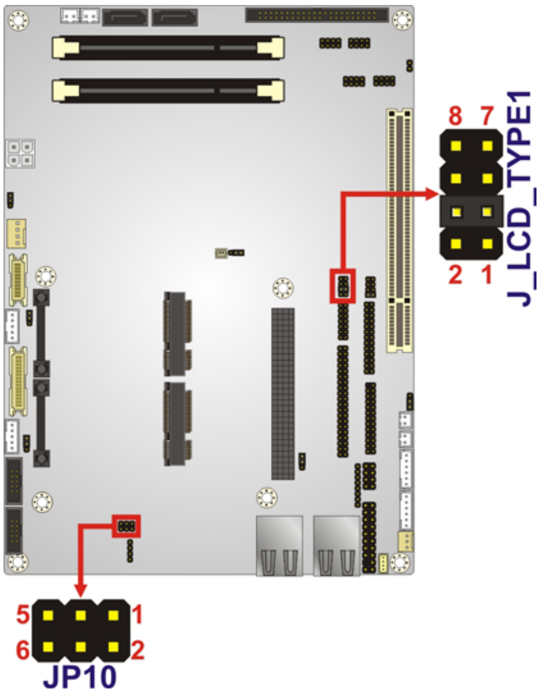


Figure 4-10:LVDS Panel Resolution Jumper Locations

4.5.8 PCI-104 Voltage Setup

Jumper Label: **JP6**

Jumper Type: 3-pin header

Jumper Settings: See **Table 4-10**

Jumper Location: See **Figure 4-11**

This jumper selects the voltage supplied to the PCI-104 expansion module.

Setting	Description
Short 1-2	+5.0 V (Default)
Short 2-3	+3.3 V

Table 4-10: PCI-104 Voltage Jumper Settings

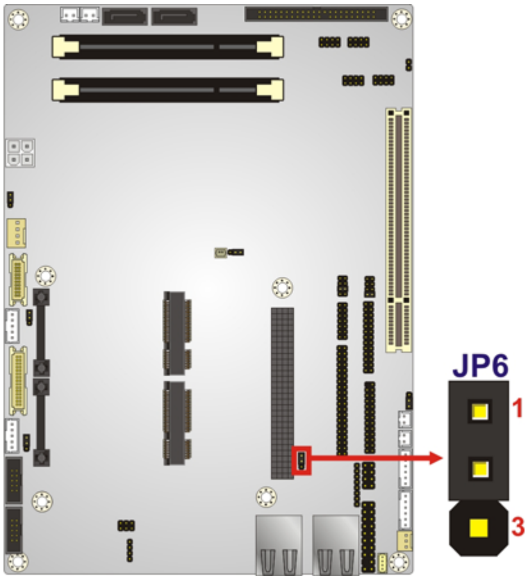


Figure 4-11: PCI-104 Voltage Jumper Location

4.6 Chassis Installation

4.6.1 Airflow

WARNING:

Airflow is critical to the cooling of the CPU and other onboard components. The chassis in which the NOVA-PV-D5251/D4251 must have air vents to allow cool air to move into the system and hot air to move out.

The NOVA-PV-D5251/D4251 must be installed in a chassis with ventilation holes on the sides allowing airflow to travel through the heat sink surface. In a system with an individual power supply unit, the cooling fan of a power supply can also help generate airflow through the board surface.

4.6.2 Motherboard Installation

To install the NOVA-PV-D5251/D4251 motherboard into the chassis please refer to the reference material that came with the chassis.

4.7 Internal Peripheral Device Connections

This section outlines the installation of peripheral devices to the onboard connectors

4.7.1 Audio Kit Installation

The Audio Kit that came with the NOVA-PV-D5251/D4251 connects to the audio connector on the NOVA-PV-D5251/D4251. The audio kit consists of three audio jacks. Mic-in connects to a microphone. Line-in provides a stereo line-level input to connect to the output of an audio device. Line-out, a stereo line-level output, connects to two amplified speakers. To install the audio kit, please refer to the steps below:

Step 1: **Locate the audio connector**. The location of the 10-pin audio connector is shown in **Chapter 3**.

Step 2: **Align pin 1**. Align pin 1 on the on-board connector with pin 1 on the audio kit connector. Pin 1 on the audio kit connector is indicated with a white dot. See Figure 4-12.

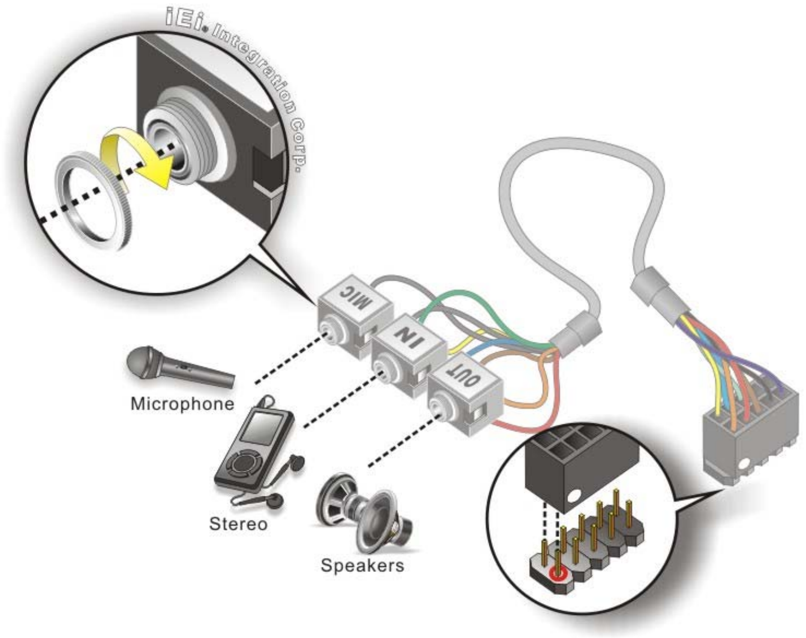


Figure 4-12: Audio Kit Cable Connection

Step 3: **Connect the audio devices**. Connect speakers to the line-out audio jack. Connect the output of an audio device to the line-in audio jack. Connect a microphone to the mic-in audio jack.

4.7.2 Keyboard/Mouse Connector

The NOVA-PV-D5251/D4251 is shipped with a keyboard/mouse Y-cable connector. The keyboard/mouse Y-cable connector connects to a keyboard/mouse connector on the NOVA-PV-D5251/D4251 and branches into two cables that are each connected to a PS/2 connector, one for a mouse and one for a keyboard. To connect the keyboard/mouse Y-cable connector, please follow the steps below.

Step 1: **Locate the connector**. The location of the keyboard/mouse Y-cable connector is shown in **Chapter 3**.

Step 2: **Align the connectors**. Correctly align pin 1 on the cable connector with pin 1 on the NOVA-PV-D5251/D4251 keyboard/mouse connector. See Figure 4-13.

Step 3: **Insert the cable connectors** Once the cable connector is properly aligned with the keyboard/mouse connector on the NOVA-PV-D5251/D4251, connect the cable connector to the on-board connectors. See Figure 4-13.

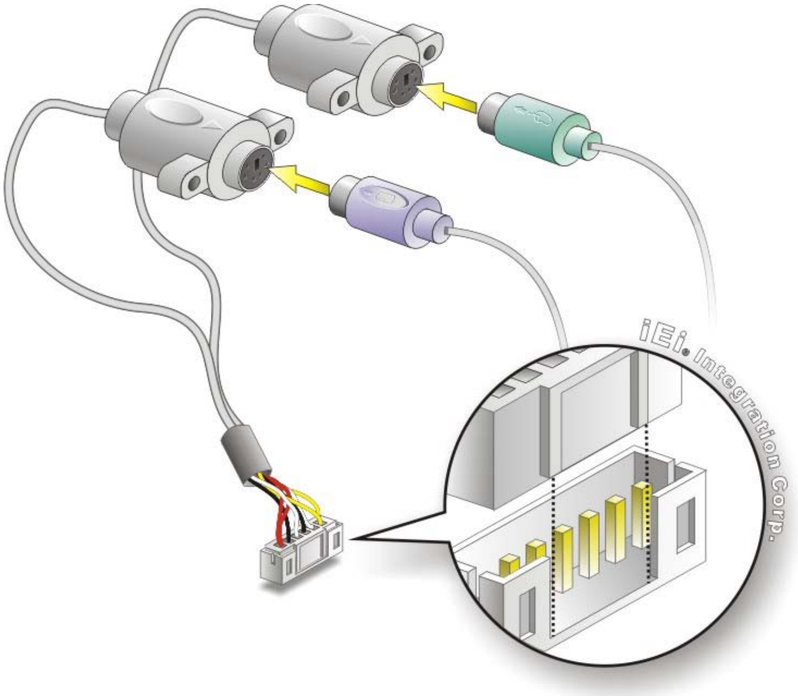


Figure 4-13: Keyboard/mouse Y-cable Connection

Step 4: **Attach PS/2 connectors to the chassis**. The keyboard/mouse Y-cable connector is connected to two PS/2 connectors. To secure the PS/2 connectors to the chassis please refer to the installation instructions that came with the chassis.

Step 5: **Connect the keyboard and mouse**. Once the PS/2 connectors are connected to the chassis, a keyboard and mouse can each be connected to one of the PS/2 connectors. The keyboard PS/2 connector and mouse PS/2 connector are both marked. Please make sure the keyboard and mouse are connected to the correct PS/2 connector.

4.7.3 LVDS LCD Installation

The NOVA-PV-D5251/D4251 can be connected to a TFT LCD screen through the LVDS crimp connector on the board. To connect a TFT LCD to the NOVA-PV-D5251/D4251, please follow the steps below.

Step 1: **Locate the connector**. The location of the LVDS connector is shown in **Chapter 3**.

Step 2: **Insert the cable connector**. Insert the connector from the LVDS PCB driving board to the LVDS connector as shown in **Figure 4-14**. When connecting the connectors make sure the pins are properly aligned.

WARNING:

The diagram below is merely for illustration. The configuration and connection of the cables from the TFT LCD screen being installed may be different. Please refer to the installation manual that came with the TFT LCD screen.

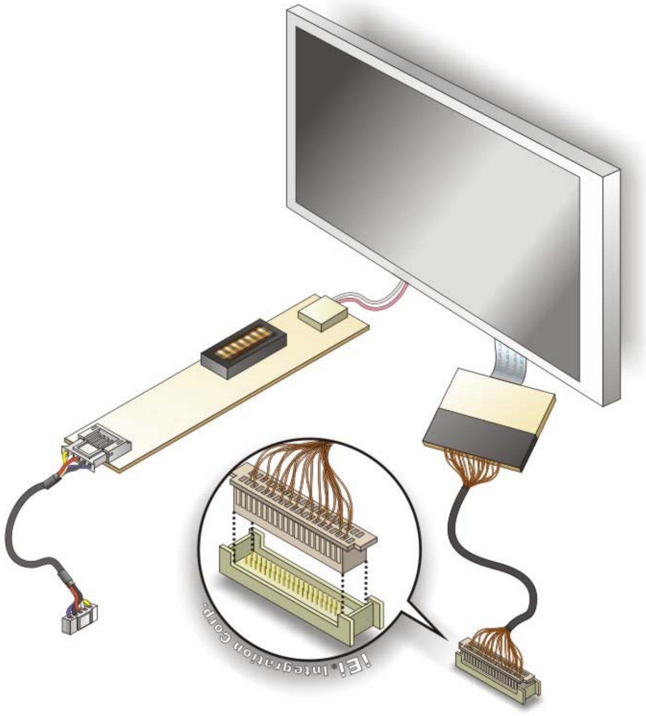


Figure 4-14: LVDS Connector

Step 3: **Locate the backlight inverter connector.** The location of the backlight inverter connector is shown in **Chapter 3**.

Step 4: **Connect backlight connector**. Connect the backlight connector to the driver TFT LCD PCB as shown in **Figure 4-15**. When inserting the cable connector, make sure the pins are properly aligned.

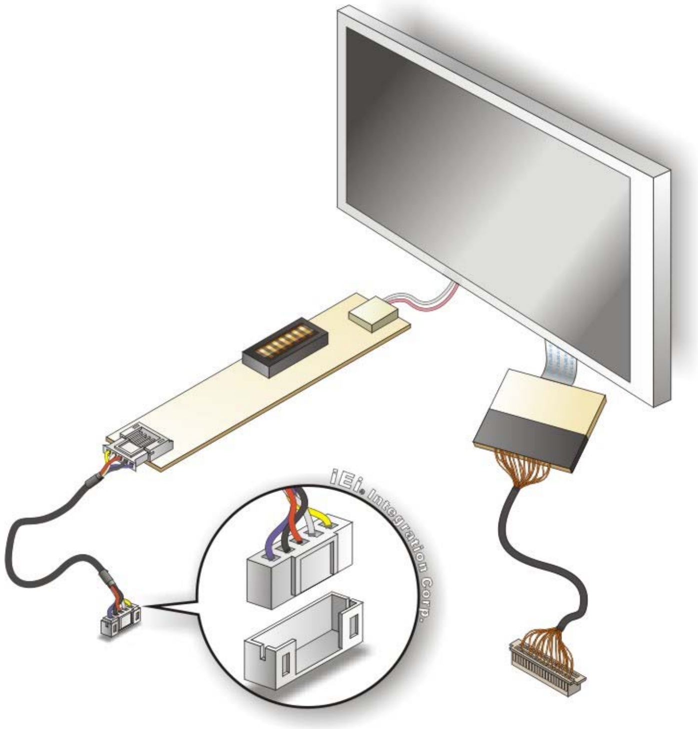


Figure 4-15: Backlight Inverter Connection

4.7.4 PCIe Mini Card Installation

To install the PCIe Mini card, please refer to the diagram and instructions below.

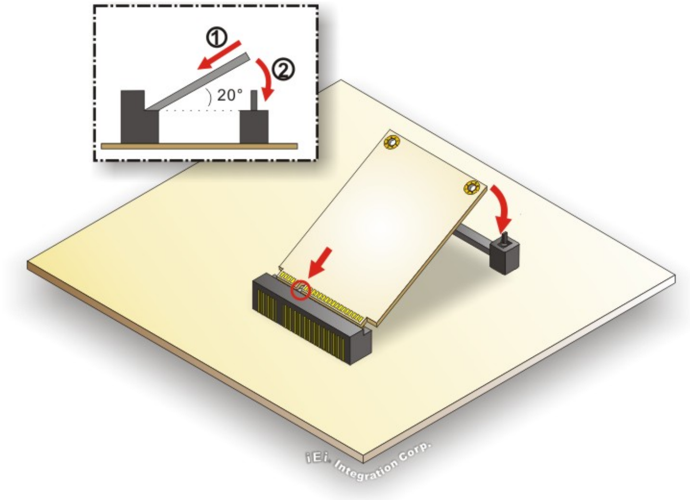


Figure 4-16: PCIe Mini Card Installation

Step 1: **Insert into the socket at an angle**. Line up the notch on the card with the notch on the connector. Slide the PCIe Mini card into the socket at an angle of about 20º.

Step 2: **Push down until the card clips into place**. Push the other end of the card down until it clips into place on the plastic connector.

4.7.5 SATA Drive Connection

The NOVA-PV-D5251/D4251 is shipped with one SATA drive cable. To connect the SATA drives to the connectors, please follow the steps below.

Step 1: **Locate the connectors**. The locations of the SATA drive connectors are shown in **Chapter 3**.

Step 2: **Insert the cable connector** into the on-board SATA drive connector. See Figure 4-17.

Step 3: **Connect the SATA power cable**. Connect the SATA power connector into the on-board SATA power connector. See Figure 4-17.

Step 4: **Connect the cable to the SATA disk**. Connect the connector on the other end of the cable to the connector at the back of the SATA drive. See Figure 4-17.

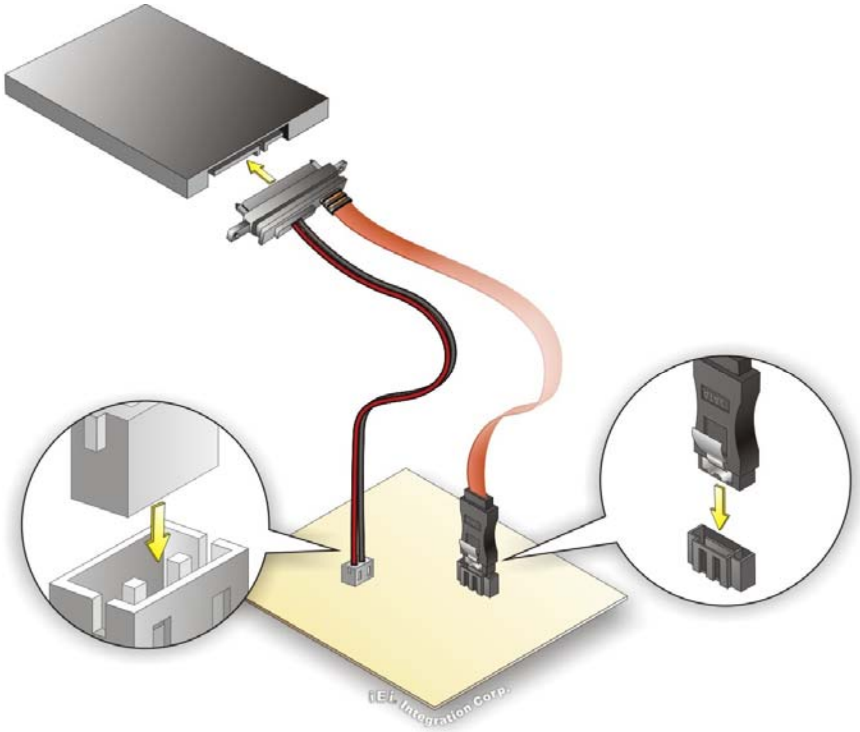


Figure 4-17: SATA Drive Connection

4.7.6 Four Serial Port Connector

The 40-pin serial port connector connects the board connector to four DB-9 connectors. To install, please follow the steps below.

Step 1: **Locate the COM connector**. The locations of the COM port connectors are shown in **Chapter 3**.

Step 2: **Insert the cable connector.** Align the cable connector with the onboard connector. Make sure pin 1 on the board and connector line up.

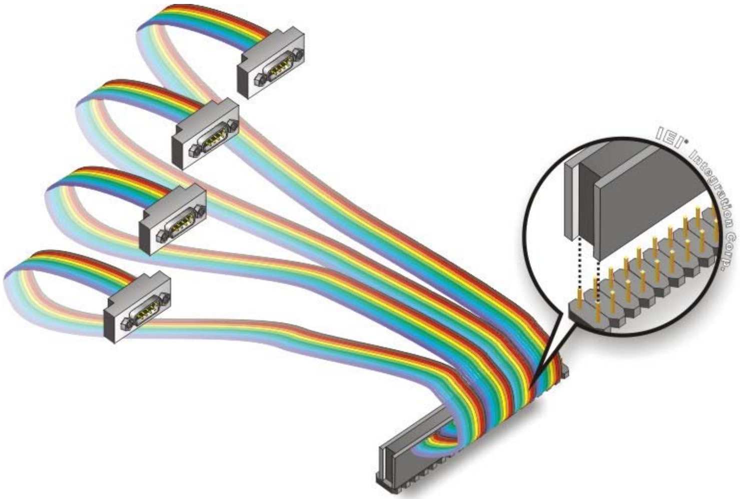


Figure 4-18: Four Serial Port Connector

Step 3: **Secure the serial ports to the chassis**. Tighten the screws on the DB-9 connectors to secure them to the chassis.

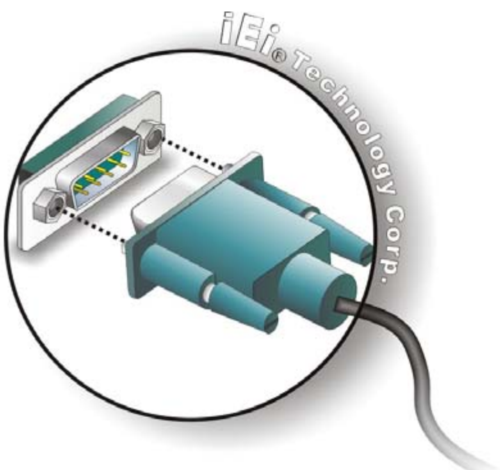


Figure 4-19: Serial Device Connector

4.7.7 USB Cable

The NOVA-PV-D5251/D4251 is shipped with a dual port USB 2.0 cable. To connect the USB cable connector, please follow the steps below.

Step 1: **Locate the connectors**. The locations of the USB connectors are shown in **Chapter 3**.

WARNING:

If the USB pins are not properly aligned, the USB device can burn out.

Step 2: **Align the connectors**. The cable has two connectors. Correctly align pin 1on each cable connector with pin 1 on the NOVA-PV-D5251/D4251 USB connector.

Step 3: **Insert the cable connectors**. Once the cable connectors are properly aligned with the USB connectors on the NOVA-PV-D5251/D4251, connect the cable connectors to the on-board connectors. See Figure 4-20.

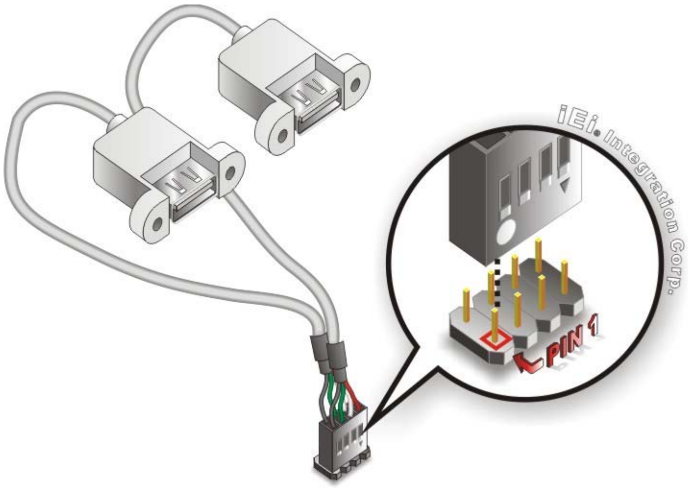


Figure 4-20: Dual USB Cable Connection

Step 4: **Attach the USB connectors to the chassis**. The USB 2.0 connectors each of two retention screw holes. To secure the connectors to the chassis please refer to the installation instructions that came with the chassis.

4.8 External Peripheral Interface Connection

The following external peripheral devices can be connected to the external peripheral interface connectors.

- HDMI devices
- RJ-45 Ethernet cable connector

To install these devices, connect the corresponding cable connector from the actual device to the corresponding NOVA-PV-D5251/D4251 external peripheral interface connector making sure the pins are properly aligned.

4.8.1 LAN Connection

There are two/four external RJ-45 LAN connectors. The RJ-45 connector enables connection to an external network. To connect a LAN cable with an RJ-45 connector, please follow the instructions below.

Step 1: **Locate the RJ-45 connectors**. The locations of the LAN connectors are shown in **Chapter 3**.

Step 2: **Align the connectors.** Align the RJ-45 connector on the LAN cable with one of the RJ-45 connectors on the NOVA-PV-D5251/D4251. See Figure 4-21.

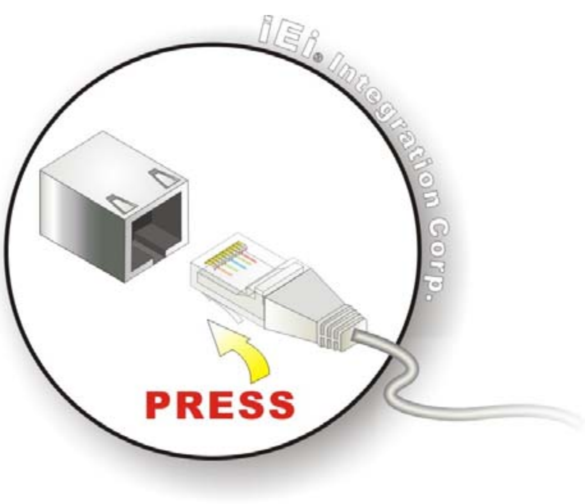


Figure 4-21: LAN Connection

Step 3: Insert the LAN cable RJ-45 connector. Once aligned, gently insert the LAN cable RJ-45 connector into the on-board RJ-45 connector.

4.8.2 Serial Device Connection (G4 Model Only)

The NOVA-PV-D5251/D4251 has an optional female DB-9 connector on the external peripheral interface panel for a serial device. Follow the steps below to connect a serial device to the NOVA-PV-D5251/D4251.

Step 1: Locate the DB-9 connector. The location of the DB-9 connector is shown in **Chapter 3**.

Step 2: Insert the serial connector. Insert the DB-9 connector of a serial device into the DB-9 connector on the external peripheral interface. See Figure 4-22.

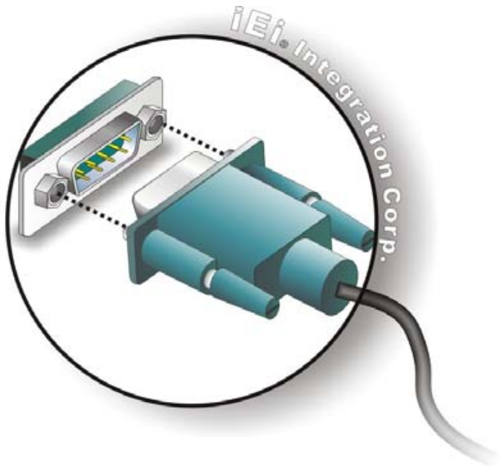


Figure 4-22: Serial Device Connector

Step 3: Secure the connector. Secure the serial device connector to the external interface by tightening the two retention screws on either side of the connector.

4.9 Software Installation

All the drivers for the NOVA-PV-D5251/D4251 are on the CD that came with the system. To install the drivers, please follow the steps below.

Step 1: Insert the CD into a CD drive connected to the system.

NOTE:

If the installation program doesn't start automatically:

Click "Start->My Computer->CD Drive->autorun.exe"

Step 2: The driver main menu appears (**Figure 4-23**).

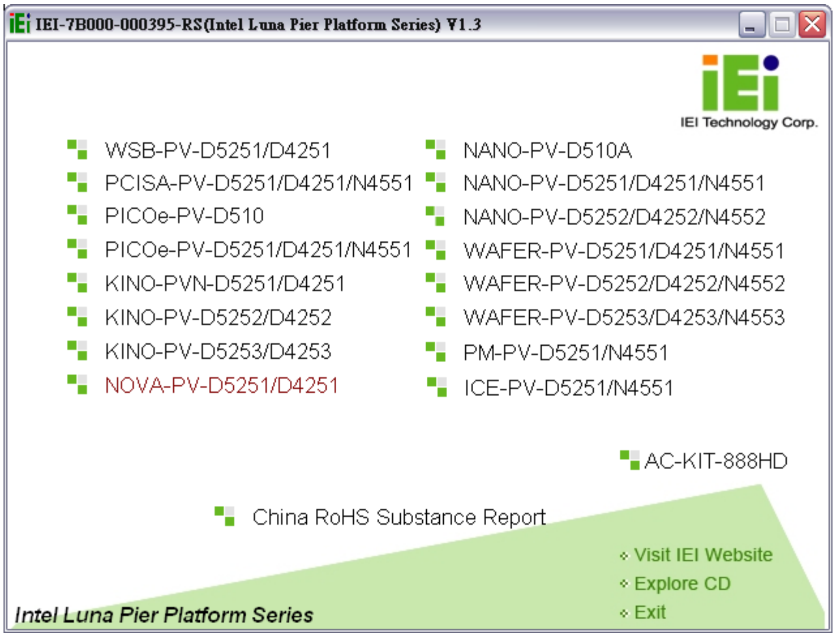


Figure 4-23: Introduction Screen

Step 3: Click **NOVA-PV-D5251/D4251**.

Step 4: A new screen with a list of available drivers appears (**Figure 4-24**).

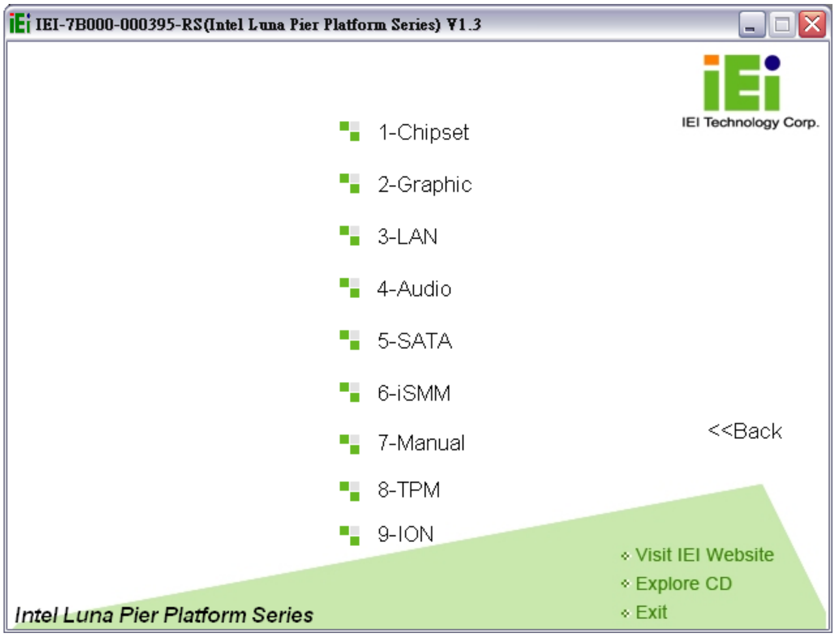


Figure 4-24: Available Drivers

Step 5: Install all of the necessary drivers in this menu.

Chapter

5

BIOS Screens

5.1 Introduction

The BIOS is programmed onto the BIOS chip. The BIOS setup program allows changes to certain system settings. This chapter outlines the options that can be changed.

NOTE:

Some of the BIOS options may vary throughout the life cycle of the product and are subject to change without prior notice.

5.1.1 Starting Setup

The UEFI BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. Press the **DELETE** or **F2** key as soon as the system is turned on or
2. Press the **DELETE** or **F2** key when the "**Press Del to enter SETUP**" message appears on the screen.

If the message disappears before the **DELETE** or **F2** key is pressed, restart the computer and try again.

5.1.2 Using Setup

Use the arrow keys to highlight items, press **ENTER** to select, use the PageUp and PageDown keys to change entries, press **F1** for help and press **ESC** to quit. Navigation keys are shown in.

Key	Function
Up arrow	Move to the item above
Down arrow	Move to the item below
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
+	Increase the numeric value or make changes

Key	Function
-	Decrease the numeric value or make changes
Page up	Move to the next page
Page down	Move to the previous page
Esc	Main Menu – Quit and do not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2 key	Load previous values
F3 key	Load optimized defaults
F4 key	Save changes and Exit BIOS

Table 5-1: BIOS Navigation Keys

5.1.3 Getting Help

When **F1** is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window press **Esc** or the **F1** key again.

5.1.4 Unable to Reboot after Configuration Changes

If the computer cannot boot after changes to the system configuration is made, CMOS defaults. Use the jumper described in **Section 4.5.2**.

5.1.5 BIOS Menu Bar

The **menu bar** on top of the BIOS screen has the following main items:

- Main – Changes the basic system configuration.
- Advanced – Changes the advanced system settings.
- Chipset – Changes the chipset settings.
- Boot – Changes the system boot configuration.
- Security – Sets User and Supervisor Passwords.

- Save & Exit – Selects exit options and loads default settings

The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

5.2 Main

The **Main** BIOS menu (**BIOS Menu 1**) appears when the **BIOS Setup** program is entered. The **Main** menu gives an overview of the basic system information.

```
      Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.
   Main    Advanced   Chipset     Boot     Security  Save & Exit

 BIOS Information                                 | Set the Time. Use Tab to
 BIOS Vendor                 American Megatrends  | switch between Time
 Core Version                4.6.4.0 0.20         | elements.
 Compliency                  UEFI 2.0             |
 Project Version             E354AR17.ROM         |
 Build Date                  12/28/2010 16:23:19  | ----------------------
                                                  |
 System Date                 [Tue 08/18/2008]     | ←→: Select Screen
 System Time                 [14:20:27]           | ↑ ↓: Select Item
                                                  | EnterSelect
 Access Level                Administrator        | F1   General Help
                                                  | F2   Previous Values
                                                  | F3   Optimized Defaults
                                                  | F4   Save
                                                  | ESC  Exit
      Version 2.10.1208. Copyright (C) 2010 American Megatrends, Inc.
```

BIOS Menu 1: Main

→ BIOS Information

The **BIOS Information** lists a brief summary of the BIOS. The fields in **BIOS Information** cannot be changed. The items shown in the system overview include:

- **BIOS Vendor:** Installed BIOS vendor
- **Core Version:** Current BIOS version
- **Project Version:** the board version
- **Build Date:** Date the current BIOS version was made

The System Overview field also has two user configurable fields:

➔ **System Date [xx/xx/xx]**

Use the **System Date** option to set the system date. Manually enter the day, month and year.

➔ **System Time [xx:xx:xx]**

Use the **System Time** option to set the system time. Manually enter the hours, minutes and seconds.

5.3 Advanced

Use the **Advanced** menu (**BIOS Menu 2**) to configure the CPU and peripheral devices through the following sub-menus:

WARNING!

Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.

```
     Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.
  Main    Advanced   Chipset     Boot     Security   Save & Exit

> ACPI Settings                                  System ACPI Parameters
> Trusted Computing
> CPU Configuration
> IDE Configuration
> USB Configuration                              ----------------------
> Super IO Configuration
> H/M Monitor                                    ←→: Select Screen
> Serial Port Console Redirection                ↑ ↓: Select Item
                                                 EnterSelect
                                                 F1   General Help
                                                 F2   Previous Values
                                                 F3    Optimized
                                                 Defaults
                                                 F4    Save
                                                 ESC   Exit
      Version 2.10.1208. Copyright (C) 2010 American Megatrends, Inc.
```

BIOS Menu 2: Advanced

5.3.1 ACPI Configuration

The **ACPI Configuration** menu (**BIOS Menu 3**) configures the Advanced Configuration and Power Interface (ACPI) options.

```
      Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.
            Advanced

ACPI Sleep State                  [S1 (CPU Stop Clock)]   Set the ACPI state used
                                                          for System suspend


                                                          ----------------------

                                                          ←→: Select Screen
                                                          ↑ ↓: Select Item
                                                          EnterSelect
                                                          F1   General Help
                                                          F2   Previous Values
                                                          F3    Optimized
                                                          Defaults
                                                          F4    Save
                                                          ESC   Exit
       Version 2.10.1208. Copyright (C) 2010 American Megatrends, Inc.
```

BIOS Menu 3: ACPI Configuration

➔ **ACPI Sleep State [S1 (CPU Stop Clock)]**

Use the **ACPI Sleep State** option to specify the sleep state the system enters when it is not being used.

➔ **S1 (CPU Stop Clock)** **DEFAULT** — The system enters S1(POS) sleep state. The system appears off. The CPU is stopped; RAM is refreshed; the system is running in a low power mode.

➔ **S3 (Suspend to RAM)** — The caches are flushed and the CPU is powered off. Power to the RAM is maintained. The computer returns slower to a working state, but more power is saved.

5.3.2 Trusted Computing

Use the **Trusted Computing** menu (**BIOS Menu 4**) to configure settings related to the Trusted Computing Group (TCG) Trusted Platform Module (TPM).

```
Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.
      Advanced

TPM Configuration                                    Enables or Disables TPM
  TPM SUPPORT                      [Disable]         support. O.S. will not
                                                     show TPM. Reset of
                                                     platform is required.
Current TPM Status Information
  TPM SUPPORT OFF
                                                     ----------------------

                                                     ←→: Select Screen
                                                     ↑ ↓: Select Item
                                                     EnterSelect
                                                     F1   General Help
                                                     F2   Previous Values
                                                     F3    Optimized
                                                     Defaults
                                                     F4    Save
                                                     ESC   Exit
Version 2.10.1208. Copyright (C) 2010 American Megatrends, Inc.
```

BIOS Menu 4: TPM Configuration

➔ **TPM Support [Disable]**

Use the **TPM Support** option to configure support for the TPM.

➔ **Disable** **DEFAULT** TPM support is disabled.

➔ **Enable** TPM support is enabled.

5.3.3 CPU Configuration

Use the **CPU Configuration** menu (**BIOS Menu 5**) to view detailed CPU specifications and configure the CPU.

```
Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.
          Advanced

CPU Configuration

Processor Type                  Intel(R) Atom(TM
                                CPU D525 @1.80GHz
EMT64                           Supported
Processor Speed                 1800 MHz
System Bus Speed                800 MHz          ----------------------
Ratio Status                    9
Actual Ratio                    9                ←→: Select Screen
Processor Stepping              106ca            ↑ ↓: Select Item
Microcode Revision              263              EnterSelect
L1 Cache RAM                    2x56 k           F1   General Help
L2 Cache RAM                    2x512 k          F2   Previous Values
Processor Core                  Dual             F3    Optimized
Hyper-Threading                 Supported        Defaults
                                                 F4    Save
                                                 ESC   Exit
Version 2.10.1208. Copyright (C) 2010 American Megatrends, Inc.
```

BIOS Menu 5: CPU Configuration

The CPU Configuration menu (**BIOS Menu 5**) lists the following CPU details:

- Processor Type
- EMT64
- Processor Speed
- System Bus Speed
- Ratio Status
- Actual Ratio
- Processor Stepping
- Microcode Revision
- L1 Cache RAM
- L2 Cache RAM
- Processor Core
- Hyper-Threading

5.3.4 IDE Configuration

Use the **IDE Configuration** menu (**BIOS Menu 6**) to change and/or set the configuration of the SATA devices installed in the system.

```
    Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.
          Advanced

PATA Master                      Not Present          Select ATA/IDE
PATA Slave                       Not Present          Configuration.

SATA Port0                       Not Present
SATA Port1                       Not Present          ---------------------
SATA Port2                       Not Present
SATA Port3                       Not Present          ←→: Select Screen
                                                      ↑ ↓: Select Item
                                                      EnterSelect
ATA/IDE Configuration            [Enhanced]           F1   General Help
  Configure SATA as              [IDE]                F2   Previous Values
                                                      F3    Optimized
                                                      Defaults
                                                      F4    Save
                                                      ESC   Exit
      Version 2.10.1208. Copyright (C) 2010 American Megatrends, Inc.
```

BIOS Menu 6: IDE Configuration

→ **ATA/IDE Configurations [Enhanced]**

Use the **ATA/IDE Configurations** option to configure the ATA/IDE controller.

→ **Disabled** — Disables the on-board ATA/IDE controller.

→ **Compatible** — Configures the on-board ATA/IDE controller to be in compatible mode. In this mode, a SATA channel will replace one of the IDE channels. This mode supports up to 4 storage devices.

→ **Enhanced** **DEFAULT** — Configures the on-board ATA/IDE controller to be in Enhanced mode. In this mode, IDE channels and SATA channels are separated. This mode supports up to 6 storage devices. Some legacy OS do not support this mode.

➔ **Configure SATA as [IDE]**

Use the **Configure SATA as** option to configure SATA devices as normal IDE devices.

➔ **IDE** DEFAULT Configures SATA devices as normal IDE device.

➔ **AHCI** Configures SATA devices as AHCI device.

5.3.5 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 7**) to read USB configuration information and configure the USB settings.

```
      Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.
          Advanced

USB Configuration                                  Enables Legacy USB
                                                   support. AUTO option
USB Devices:                                       disables legacy support
       None                                        if no USB devices are
                                                   connected. DISABLE
Legacy USB Support              [Enabled]          option will keep USB
                                                   devices available only
                                                   for EFI applications.

                                                   ---------------------
                                                   ←→: Select Screen
                                                   ↑ ↓: Select Item
                                                   EnterSelect
                                                   F1   General Help
                                                   F2   Previous Values
                                                   F3    Optimized
                                                   Defaults
                                                   F4    Save
                                                   ESC   Exit
      Version 2.10.1208. Copyright (C) 2010 American Megatrends, Inc.
```

BIOS Menu 7: USB Configuration

➔ **USB Devices**

The **USB Devices Enabled** field lists the USB devices that are enabled on the system

➔ **Legacy USB Support [Enabled]**

Use the **Legacy USB Support** BIOS option to enable USB mouse and USB keyboard support. Normally if this option is not enabled, any attached USB mouse or USB keyboard

does not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB driver loaded onto the system.

- ➔ **Enabled** **DEFAULT** Legacy USB support enabled
- ➔ **Disabled** Legacy USB support disabled
- ➔ **Auto** Legacy USB support disabled if no USB devices are connected

5.3.6 Super IO Configuration

Use the **Super IO Configuration** menu (**BIOS Menu 8**) to set or change the configurations for the FDD controllers, parallel ports and serial ports.

```
      Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.
          Advanced
Super IO Configuration                         | Set Parameters of Serial
                                               | Port 0 (COMA)
Super IO Chip                  Fintek F81865   |
> Serial Port 0 Configuration                  |
> Serial Port 1 Configuration                  | ---------------------
> Serial Port 2 Configuration                  | ←→: Select Screen
> Serial Port 3 Configuration                  | ↑ ↓: Select Item
> Serial Port 4 Configuration                  | EnterSelect
> Serial Port 5 Configuration                  | F1   General Help
> Parallel Port Configuration                  | F2   Previous Values
                                               | F3    Optimized
                                               | Defaults
                                               | F4    Save
                                               | ESC   Exit
      Version 2.10.1208. Copyright (C) 2010 American Megatrends, Inc.
```

BIOS Menu 8: Super IO Configuration

5.3.6.1 COM n Configuration

Use the **COM n Configuration** menu (**BIOS Menu 9**) to configure the serial port n.

```
Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.
        Advanced

COM1 Configuration                              Enable or Disable Serial
                                                Port (COM)
Serial Port                  [Enabled]
Device Settings              IO=3F8h; IRQ=4
                                                ---------------------
Change Settings              [Auto]             ←→: Select Screen
                                                ↑ ↓: Select Item
                                                EnterSelect
                                                F1   General Help
                                                F2   Previous Values
                                                F3    Optimized
                                                Defaults
                                                F4    Save
                                                ESC   Exit
Version 2.10.1208. Copyright (C) 2010 American Megatrends, Inc.
```

BIOS Menu 9: COM n Configuration Menu

5.3.6.1.1 Serial Port 0 Configuration

➔ **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled** — Disable the serial port

➔ **Enabled** — DEFAULT — Enable the serial port

➔ **Change Settings [Auto]**

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

➔ **Auto** — DEFAULT — The serial port IO port address and interrupt address are automatically detected.

➔ **IO=3F8h; IRQ=4** — Serial Port I/O port address is 3F8h and the interrupt address is IRQ4

➔ **IO=3F8h; IRQ=3, 4**		Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4
➔ **IO=2F8h; IRQ=3, 4**		Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4

5.3.6.1.2 Serial Port 1 Configuration

➔ **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled**		Disable the serial port
➔ **Enabled**	**DEFAULT**	Enable the serial port

➔ **Change Settings [Auto]**

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

➔ **Auto**	**DEFAULT**	The serial port IO port address and interrupt address are automatically detected.
➔ **IO=2F8h; IRQ=3**		Serial Port I/O port address is 2F8h and the interrupt address is IRQ3
➔ **IO=3F8h; IRQ=3, 4**		Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4
➔ **IO=2F8h; IRQ=3, 4**		Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4

5.3.6.1.3 Serial Port 2 Configuration

➔ **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled**		Disable the serial port

→ **Enabled** **DEFAULT** Enable the serial port

→ **Change Settings [Auto]**

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

→ **Auto** **DEFAULT** The serial port IO port address and interrupt address are automatically detected.

→ **IO=3E8h; IRQ=11** Serial Port I/O port address is 3E8h and the interrupt address is IRQ11

→ **IO=3E8h; IRQ=10, 11** Serial Port I/O port address is 3E8h and the interrupt address is IRQ10, 11

→ **IO=2E8h; IRQ=10, 11** Serial Port I/O port address is 2E8h and the interrupt address is IRQ10, 11

5.3.6.1.4 Serial Port 3 Configuration

→ **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the serial port.

→ **Disabled** Disable the serial port

→ **Enabled** **DEFAULT** Enable the serial port

→ **Change Settings [Auto]**

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

→ **Auto** **DEFAULT** The serial port IO port address and interrupt address are automatically detected.

→ **IO=2E8h; IRQ=10** Serial Port I/O port address is 2E8h and the interrupt address is IRQ10

➔ **IO=3E8h; IRQ=10, 11**		Serial Port I/O port address is 3E8h and the interrupt address is IRQ10, 11
➔ **IO=2E8h; IRQ=10, 11**		Serial Port I/O port address is 2E8h and the interrupt address is IRQ10, 11

5.3.6.1.5 Serial Port 4 Configuration

➔ **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled**		Disable the serial port
➔ **Enabled**	**DEFAULT**	Enable the serial port

➔ **Change Settings [Auto]**

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

➔ **Auto**	**DEFAULT**	The serial port IO port address and interrupt address are automatically detected.
➔ **IO=2E0h; IRQ=7**		Serial Port I/O port address is 2E0h and the interrupt address is IRQ7
➔ **IO=3F8h; IRQ=3, 4, 5, 6, 7, 10, 11, 12**		Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4, 5, 6, 7, 10, 11, 12
➔ **IO=2F8h; IRQ=3, 4, 5, 6, 7, 10, 11, 12**		Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4, 5, 6, 7, 10, 11, 12
➔ **IO=3E8h; IRQ=3, 4, 5, 6, 7, 10, 11, 12**		Serial Port I/O port address is 3E8h and the interrupt address is IRQ3, 4, 5, 6, 7, 10, 11, 12
➔ **IO=2E8h; IRQ=3, 4, 5, 6, 7, 10, 11, 12**		Serial Port I/O port address is 2E8h and the interrupt address is IRQ3, 4, 5, 6, 7, 10, 11, 12

- ➔ **IO=2E0h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12** — Serial Port I/O port address is 2E0h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
- ➔ **IO=2F0h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12** — Serial Port I/O port address is 2F0h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12

5.3.6.1.6 Serial Port 5 Configuration

➔ **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the serial port.

- ➔ **Disabled** — Disable the serial port
- ➔ **Enabled** DEFAULT — Enable the serial port

➔ **Change Settings [Auto]**

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

- ➔ **Auto** DEFAULT — The serial port IO port address and interrupt address are automatically detected.
- ➔ **IO=2D0h; IRQ=10** — Serial Port I/O port address is 2D0h and the interrupt address is IRQ10
- ➔ **IO=2E0h; IRQ=10, 11** — Serial Port I/O port address is 2E0h and the interrupt address is IRQ10, 11
- ➔ **IO=2D0h; IRQ=10, 11** — Serial Port I/O port address is 2D0h and the interrupt address is IRQ10, 11
- ➔ **IO=2D8h; IRQ=10, 11** — Serial Port I/O port address is 2D8h and the interrupt address is IRQ10, 11
- ➔ **IO=2B0h; IRQ=10, 11** — Serial Port I/O port address is 2B0h and the interrupt address is IRQ10, 11

5.3.6.1.7 Parallel Port Configuration

➔ **Parallel Port [Enabled]**

Use the **Parallel Port** option to enable or disable the parallel port.

➔	**Disabled**		Disable the parallel port
➔	**Enabled**	**DEFAULT**	Enable the parallel port

➔ **Change Settings [Auto]**

Use the **Change Settings** option to change the parallel port IO port address and interrupt address.

➔	**Auto**	**DEFAULT**	The parallel port IO port address and interrupt address are automatically detected.
➔	**IO=378h; IRQ=7**		Parallel Port I/O port address is 378h and the interrupt address is IRQ7
➔	**IO=278h; IRQ=7**		Parallel Port I/O port address is 278h and the interrupt address is IRQ7
➔	**IO=3BCh; IRQ=7**		Parallel Port I/O port address is 3BCh and the interrupt address is IRQ7

➔ **Device Mode [Standard and Bi-direction (SPP) mode]**

Use the **Device Mode** option to select the mode the parallel port operates in.

- Printer Mode
- Standard and Bi-direction (SPP) Mode
- EPP-1.9 and SPP Mode
- EPP 1.7 and SPP Mode
- ECP Mode
- ECP and EPP 1.9 Mode
- ECP and EPP 1.7 Mode

5.3.7 H/W Monitor

The H/W Monitor menu (**BIOS Menu 10**) shows the operating temperature, fan speeds and system voltages.

```
Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.
            Advanced

PC Health Status

CPU Temperature                  :+65 C
SYS Temperature                  :+39 C
CPU FAN Speed                    :N/A
SYS FAN Speed                    :N/A
VCC3V                            :+3.312 V
V_core                           :+1.160 V         ---------------------
V1.05S                           :+1.048 V         ←→: Select Screen
Vcc3S                            :+3.332 V         ↑ ↓: Select Item
Vcc5V                            :+5.045 V         EnterSelect
VSB3V                            :+3.312 V         F1   General Help
VBAT                             :+3.248 V         F2   Previous Values
                                                   F3    Optimized
CPU Smart Fan Control            [Auto Mode]       Defaults
Temperature Bound 1              60                F4    Save
Temperature Bound 2              50                ESC   Exit
Temperature Bound 3              40
Temperature Bound 4              30
SYS Smart Fan Control            [Auto Mode]
Temperature Bound 1              60
Temperature Bound 2              50
Temperature Bound 3              40
Temperature Bound 4              30

Version 2.10.1208. Copyright (C) 2010 American Megatrends, Inc.
```

BIOS Menu 10: Hardware Health Configuration

➔ **CPU Smart Fan Control [Auto Mode]**

Use the **CPU Smart Fan Control** option to configure the CPU fan.

- **Auto Mode** — **DEFAULT** — The fan adjusts its speed using these settings by RPM:
  - Temperature Bound 1
  - Temperature Bound 2
  - Temperature Bound 3
  - Temperature Bound 4
- **Manual Mode** — The fan spins at the speed set in:
  - Manual Duty Cycle Setting
  - (Min=0, Max=100)

NOTE:

Smart fan functions are supported only when using a 4-pin fan. When using a 3-pin fan, the functions are not supported.

First Boundary Temperature [60]

WARNING:

CPU failure can result if this value is set too high

When the fan is off, it will only start when the temperature exceeds this setting.

- Minimum Value: 0°C
- Maximum Value: 127°C

Second Boundary Temperature [50]

WARNING:

CPU failure can result if this value is set too high

When the fan is off, it will only start when the temperature exceeds this setting.

- Minimum Value: 0°C
- Maximum Value: 127°C

➔ **Third Boundary Temperature [40]**

WARNING:

CPU failure can result if this value is set too high

When the fan is off, it will only start when the temperature exceeds this setting.

- Minimum Value: 0°C
- Maximum Value: 127°C

➔ **Fourth Boundary Temperature [30]**

WARNING:

CPU failure can result if this value is set too high

When the fan is off, it will only start when the temperature exceeds this setting.

- Minimum Value: 0°C
- Maximum Value: 127°C

➔ **PC Health Status**

The following system parameters and values are shown. The system parameters that are monitored are:

- System Temperatures:
  - CPU Temperature
  - System Temperature
- Fan Speeds:

- CPU Fan Speed
- System Fan Speed

- Voltages:
  - VCC3V
  - V_core
  - V1.05S
  - Vcc3S
  - Vcc5V
  - VSB3V
  - VBAT

5.3.8 Serial Port Console Redirection

The **Serial Port Console Redirection** menu (**BIOS Menu 11**) allows the console redirection options to be configured. Console redirection allows users to maintain a system remotely by re-directing keyboard input and text output through the serial port.

```
Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.
     Advanced

  COM0                                        Console Redirection
  Console Redirection         [Disabled]      Enable or Disable.
> Console Redirection Settings

  COM1
  Console Redirection         [Disabled]
> Console Redirection Settings

  COM2
  Console Redirection         [Disabled]
> Console Redirection Settings

  COM3                                        ---------------------
  Console Redirection         [Disabled]      ←→: Select Screen
> Console Redirection Settings                ↑ ↓: Select Item
                                              EnterSelect
  COM4                                        F1   General Help
  Console Redirection         [Disabled]      F2   Previous Values
> Console Redirection Settings                F3    Optimized
                                              Defaults
                                              F4    Save
                                              ESC   Exit
Version 2.10.1208. Copyright (C) 2010 American Megatrends, Inc.
```

BIOS Menu 11: Serial Port Console Redirection

➔ Console Redirection [Disabled]

Use **Console Redirection** option to enable or disable the console redirection function.

- ➔ **Disabled** **DEFAULT** Disabled the console redirection function
- ➔ **Enabled** Enabled the console redirection function

5.3.8.1 Console Redirection Settings

The **Console Redirection Settings** menu (**BIOS Menu 12**) allows the console redirection options to be configured. The option is active when Console Redirection option is enabled.

```
Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.
        Advanced

COM0                                          Emulation: ANSI:
Console Redirection Settings                  Extended ASCII char set.
                                              VT100: ASCII char set.
Terminal Type                 [ANSI]          VT100+: Extends VT100 to
Bits per second               [115200]        support color, function
Data Bits                     8               keys, etc. VT-UTF8: Uses
Parity                        None            UTF8 encoding to map
Stop Bits                     1               Unicode chars onto 1 or
                                              more bytes.

                                              ---------------------
                                              ←→: Select Screen
                                              ↑ ↓: Select Item
                                              EnterSelect
                                              F1   General Help
                                              F2   Previous Values
                                              F3    Optimized
                                              Defaults
                                              F4    Save
                                              ESC   Exit
Version 2.00.1201. Copyright (C) 2009 American Megatrends, Inc.
```

BIOS Menu 12: Console Redirection Settings

➔ Terminal Type [ANSI]

Use the **Terminal Type** option to specify the remote terminal type..

- ➔ **VT100** The target terminal type is VT100
- ➔ **VT100+** The target terminal type is VT100+

➔ **ANSI** **DEFAULT** The target terminal type is ANSI

➔ **Bits per second [115200]**

Use the **Bits per second** option to specify the transmission speed of the serial port.

➔ **9600** The transmission speed is 9600

➔ **19200** The transmission speed is 19200

➔ **57600** The transmission speed is 57600

➔ **115200** **DEFAULT** The transmission speed is 115200

5.4 Chipset

Use the **Chipset** menu (**BIOS Menu 13**) to access the Northbridge and Southbridge configuration menus

WARNING!

Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.

```
      Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.
   Main    Advanced   Chipset     Boot    Security  Save & Exit

> Host Bridge                                      North Bridge Parameters
> South Bridge
> Intel IDG SWSCI OpRegion
                                                   --------------------
                                                   ←→: Select Screen
                                                   ↑ ↓: Select Item
                                                   EnterSelect
                                                   F1   General Help
                                                   F2   Previous Values
                                                   F3    Optimized
                                                   Defaults
                                                   F4    Save
                                                   ESC   Exit
        Version 2.10.1208. Copyright (C) 2010 American Megatrends, Inc.
```

BIOS Menu 13: Chipset

5.4.1 Host Bridge Configuration

Use the **Host Bridge Configuration** menu (**BIOS Menu 14**) to configure the Northbridge chipset.

```
 Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.
                    Chipset

Initate Graphic Adapter          [PEG/IGD]        Select which graphics
                                                  controller to use as the
******Memory Information******                    primary boot device.

Memory Frequency                 800 Mhz

Total Memory                     2048 MB

DIMM#0                           2048 MB          ---------------------
DIMM#1                           Not Present      ←→: Select Screen
                                                  ↑ ↓: Select Item
                                                  EnterSelect
                                                  F1   General Help
                                                  F2   Previous Values
                                                  F3    Optimized
                                                  Defaults
                                                  F4    Save
                                                  ESC   Exit
 Version 2.10.1208. Copyright (C) 2010 American Megatrends, Inc.
```

BIOS Menu 14: Host Bridge Configuration

→ **Initiate Graphics Adapter [PEG/IGD]**

Use the **Initiate Graphics Adapter** option to select the graphics controller used as the primary boot device. Select either an integrated graphics controller (IGD) or a combination of PCI graphics controller, a PCI express (PEG) controller or an IGD. Configuration options are listed below:

- IGD **DEFAULT**
- PCI/IGD

5.4.2 South Bridge Configuration

Use the **South Bridge Configuration** menu (**BIOS Menu 15**) to configure the Southbridge chipset.

```
   Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.
                  Chipset
Auto Power Button Function        [Disabled]     Restore AC Power state
Restore AC Power Loss             [Last State]   when power is re-applied
HD Audio Controller               [Enabled]      after a power failure.
USB Function                      [Enabled]      When Auto Power Button
USB 2.0 (EHCI) Support            [Enabled]      Function select Enabled
Set Spread Spectrum function      [Disabled]     the AC power loss will
                                                 always power on.

                                                 ---------------------
                                                 ←→: Select Screen
                                                 ↑ ↓: Select Item
                                                 EnterSelect
                                                 F1   General Help
                                                 F2   Previous Values
                                                 F3    Optimized
                                                 Defaults
                                                 F4    Save
                                                 ESC   Exit
    Version 2.10.1208. Copyright (C) 2010 American Megatrends, Inc.
```

BIOS Menu 15:South Bridge Chipset Configuration

➔ **Restore AC Power Loss [Last State]**

Use the **Restore on AC Power Loss** BIOS option to specify what state the system returns to if there is a sudden loss of power to the system.

➔ **Power Off** — The system remains turned off

➔ **Power On** — The system turns on

➔ **Last State** **DEFAULT** — The system returns to its previous state. If it was on, it turns itself on. If it was off, it remains off.

➔ **HD Audio Controller [Enabled]**

Use the **HD Audio Controller** option to enable or disable the High Definition Audio controller.

- **Enabled** **DEFAULT** The onboard High Definition Audio controller automatically detected and enabled
- **Disabled** The onboard High Definition Audio controller is disabled

USB Function [Enabled]

Use the **USB Function** BIOS option to enable or disable USB function support.

- **Disabled** USB function support disabled
- **Enabled** **DEFAULT** USB function support enabled

USB 2.0 (EHCI) Support [Enabled]

Use the **USB 2.0 (EHCI) Support** BIOS option to enable or disable the USB 2.0 controller

- **Enabled** **DEFAULT** USB 2.0 controller enabled
- **Disabled** USB 2.0 controller disabled

Set Spread Spectrum function [Disabled]

Use the **Set Spread Spectrum function** option to reduce the EMI. Excess EMI is generated when the system clock generator pulses have extreme values. Spreading the pulse spectrum modulates changes in the extreme values from spikes to flat curves, thus reducing the EMI. This benefit may in some cases be outweighed by problems with timing-critical devices, such as a clock-sensitive SCSI device.

- **Disabled** **DEFAULT** EMI not reduced
- **Enabled** EMI reduced

5.4.3 Intel IGD SWSCI OpRegion

Use the **Intel IGD SWSCI OpRegion** menu to configure the video device connected to the system.

```
Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.
                    Chipset

Intel IGD SWSCI OpRegion Configuration          Select the DVMT/FIXED
                                                Mode Memory size used by
DVMT Mode Select              [DVMT Mode]       Internal Graphics
DVMT/FIXED Memory             [Maximum]         Device.
IGD – Boot Type               [VBIOS Default]
LCD Panel Type                [Select by Panel ID]
Panel ID Resolution           800x600 18bit     ---------------------
                                                ←→: Select Screen
                                                ↑ ↓: Select Item
                                                EnterSelect
                                                F1   General Help
                                                F2   Previous Values
                                                F3    Optimized
                                                Defaults
                                                F4    Save
                                                ESC   Exit
Version 2.10.1208. Copyright (C) 2010 American Megatrends, Inc.
```

BIOS Menu 16: Intel IGD SWSCI OpRegion

→ **DVMT Mode Select [DVMT Mode]**

Use the **DVMT Mode Select** option to select the Intel Dynamic Video Memory Technology (DVMT) operating mode.

→ **Fixed Mode** — A fixed portion of graphics memory is reserved as graphics memory.

→ **DVMT Mode** **DEFAULT** — Graphics memory is dynamically allocated according to the system and graphics needs.

→ **DVMT/FIXED Memory [Maximum]**

Use the **DVMT/FIXED Memory** option to specify the maximum amount of memory that can be allocated as graphics memory. Configuration options are listed below.

- 128 MB
- 256 MB

- Maximum **DEFAULT**

→ **IGD – Boot Type [VBIOS Default]**

Use the **IGD – Boot Type** option to select the display device used by the system when it boots. Configuration options are listed below.

- VBIOS Default **DEFAULT**
- CRT
- LFP
- CRT + LFP

→ **LCD Panel Type [Select by Panel ID]**

Use the **LCD Panel Type** option to select the type of flat panel connected to the system. Configuration options are listed below.

- Select by Panel ID **DEFAULT**
- 640x480 18bit
- 800x480 18bit
- 800x600 18bit
- 1024x768 18bit
- 1280x1024 18bit
- 1366x768 18bit
- 1280x800 18bit
- 1280x600 18bit

→ **Panel ID Resolution**

Displays the panel resolution detected by the BIOS.

5.5 Boot

Use the **Boot** menu (**BIOS Menu 17**) to configure system boot options.

```
     Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.
  Main    Advanced   Chipset     Boot     Security  Save & Exit

Boot Configuration                                    Select the keyboard
Bootup NumLock State              [On]                NumLock state

Quiet Boot                        [Enabled]
Launch PXE OpROM                  [Disabled]          ---------------------
                                                      ←→: Select Screen
Boot Option Priorities                                ↑ ↓: Select Item
                                                      EnterSelect
                                                      F1   General Help
                                                      F2   Previous Values
                                                      F3    Optimized
                                                      Defaults
                                                      F4    Save
                                                      ESC   Exit
      Version 2.10.1208. Copyright (C) 2010 American Megatrends, Inc.
```

BIOS Menu 17: Boot

→ **Bootup NumLock State [On]**

Use the **Bootup NumLock State** BIOS option to specify if the number lock setting must be modified during boot up.

→ **On** **DEFAULT** Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit.

→ **Off** Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged.

➔ **Quiet Boot [Enabled]**

Use the **Quiet Boot** BIOS option to select the screen display when the system boots.

➔ **Disabled** Normal POST messages displayed

➔ **Enabled** **DEFAULT** OEM Logo displayed instead of POST messages

➔ **Launch PXE OpROM [Disabled]**

Use the **Launch PXE OpROM** option to enable the Realtek 8111E PCIe GbE controller to boot the system.

➔ **Disabled** **DEFAULT** Cannot be booted from a remote system through the Realtek 8111E PCIe GbE controller

➔ **Enabled** Can be booted from a remote system through the Realtek 8111E PCIe GbE controller

5.6 Security

Use the **Security** menu (**BIOS Menu 18**) to set system and user passwords.

```
      Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.
   Main    Advanced  Chipset     Boot     Security  Save & Exit

Password Description                              Set Setup Administrator
                                                  Password
If ONLY the Administrator's password is set,
then this only limits access to Setup and is
only asked for when entering Setup
If ONLY the User's password is set, then this
is a power on password and must be entered to     ---------------------
boot or enter Setup. In Setup the User will       ←→: Select Screen
have Administrator rights.                        ↑ ↓: Select Item
                                                  EnterSelect
Administrator Password                            F1   General Help
User Password                                     F2   Previous Values
                                                  F3    Optimized
Set User Password                                 Defaults
Set Master Password                               F4    Save
                                                  ESC   Exit
        Version 2.10.1208. Copyright (C) 2010 American Megatrends, Inc.
```

BIOS Menu 18: Security

➔ **Administrator Password**

Use the **Administrator Password** to set or change a administrator password.

➔ **User Password**

Use the **User Password** to set or change a user password.

5.7 Exit

Use the **Exit** menu (**BIOS Menu 19**) to load default BIOS values, optimal failsafe values and to save configuration changes.

```
      Aptio Setup Utility – Copyright (C) 2010 American Megatrends, Inc.
 Main    Advanced   Chipset     Boot     Security  Save & Exit

 Save Changes and Reset                          Exit system setup after
 Discard Changes and Reset                       saving the changes.

 Restore Defaults
 Save as User Defaults
 Restore User Defaults

                                                 ---------------------
                                                 ←→: Select Screen
                                                 ↑ ↓: Select Item
                                                 EnterSelect
                                                 F1   General Help
                                                 F2   Previous Values
                                                 F3    Optimized
                                                 Defaults
                                                 F4    Save
                                                 ESC   Exit
       Version 2.10.1208. Copyright (C) 2010 American Megatrends, Inc.
```

BIOS Menu 19:Exit

➔ **Save Changes and Reset**

Use the **Save Changes and Reset** option to save the changes made to the BIOS options and to exit the BIOS configuration setup program.

➔ **Discard Changes and Reset**

Use the **Discard Changes and Reset** option to exit the system without saving the changes made to the BIOS configuration setup program.

→ **Restore Defaults**

Use the **Restore Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F3 key can be used for this operation.**

→ **Save as User Defaults**

Use the **Save as User Defaults** option to save the changes done so far as user defaults.

→ **Restore User Defaults**

Use the **Restore User Defaults** option to restore the user defaults to all the setup options.

Appendix

A

BIOS Menu Options

Appendix

B

One Key Recovery

B.1 One Key Recovery Introduction

The IEI one key recovery is an easy-to-use front end for the Norton Ghost system backup and recovery tool. This tool provides quick and easy shortcuts for creating a backup and reverting to that backup or reverting to the factory default settings.

NOTE:

The latest One Key Recovery software provides an auto recovery function that allows a system running Microsoft Windows OS to automatically restore from the factory default image after encountering a Blue Screen of Death (BSoD) or a hang for around 10 minutes. Please refer to Section B.3 for the detailed setup procedure.

The IEI One Key Recovery tool menu is shown below.

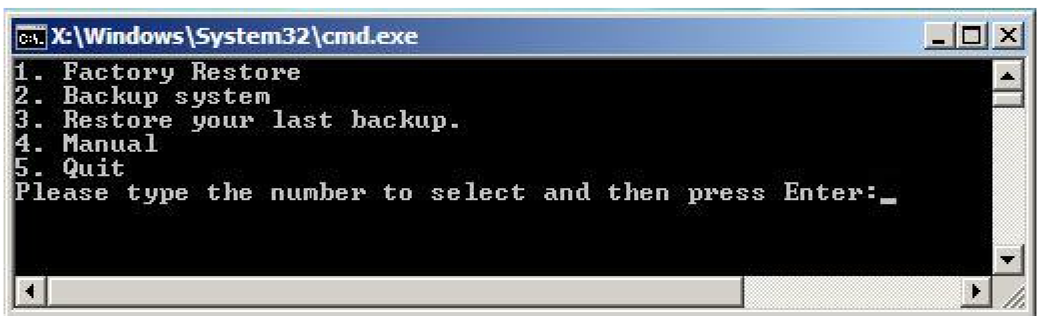


Figure B-1: IEI One Key Recovery Tool Menu

Prior to using the IEI One Key Recovery tool (as shown in **Figure B-1**) to backup or restore Windows system, five setup procedures are required.

1. Hardware and BIOS setup (see **Section B.2.1**)
2. Create partitions (see **Section B.2.2**)
3. Install operating system, drivers and system applications (see **Section B.2.3**)
4. Build the recovery partition (see **Section B.2.4**)
5. Create factory default image (see **Section B.2.5**)

After completing the five initial setup procedures as described above, users can access the recovery tool by pressing <**F3**> while booting up the system. The detailed information of each function is described in **Section B.5**.

NOTE:

The initial setup procedures for Linux system are described in **Section B.3**.

B.1.1 System Requirement

NOTE:

The recovery CD can only be used with IEI products. The software will fail to run and a warning message will appear when used on non-IEI hardware.



To create the system backup, the main storage device must be split into two partitions (three partitions for Linux). The first partition will be for the operating system, while the second partition will be invisible to the operating system and contain the backup made by the one key recovery software.

The partition created for recovery images must be big enough to contain both the factory default image and the user backup image. The size must be calculated before creating the

partitions. Please take the following table as a reference when calculating the size of the partition.

	OS	OS Image after Ghost	Compression Ratio
Windows® 7	7 GB	5 GB	70%
Windows® XPE	776 MB	560 MB	70%
Windows® CE 6.0	36 MB	28 MB	77%

NOTE:

Specialized tools are required to change the partition size if the operating system is already installed.

B.1.2 Supported Operating System

The recovery CD is compatible with both Microsoft Windows and Linux operating systems (OS). The supported OS versions are listed below.

- Microsoft Windows
  - Windows 2000
  - Windows XP (Service Pack 2 or 3 required)
  - Windows Vista
  - Windows 7
  - Windows CE 5.0
  - Windows CE 6.0
  - Windows XP Embedded
  - Windows Embedded Standard 7

NOTE:

The auto recovery function (described in Section B.3) and the restore through LAN function (described in Section B.6) are not supported in the Windows CE 5.0/6.0 operating system environment.

- Linux
  - Fedora Core 12 (Constantine)
  - Fedora Core 11 (Leonidas)
  - Fedora Core 10 (Cambridge)
  - Fedora Core 8 (Werewolf)
  - Fedora Core 7 (Moonshine)
  - RedHat RHEL-5.4
  - RedHat 9 (Ghirke)
  - Ubuntu 8.10 (Intrepid)
  - Ubuntu 7.10 (Gutsy)
  - Ubuntu 6.10 (Edgy)
  - Debian 5.0 (Lenny)
  - Debian 4.0 (Etch)
  - SuSe 11.2
  - SuSe 10.3

NOTE:

Installing unsupported OS versions may cause the recovery tool to fail.

B.2 Setup Procedure for Windows

Prior to using the recovery tool to backup or restore, a few setup procedures are required.

Step 1: Hardware and BIOS setup (see **Section B.2.1**)

Step 2: Create partitions (see **Section B.2.2**)

Step 3: Install operating system, drivers and system applications (see **Section B.2.3**)

Step 4: Build the recovery partition (see **Section B.2.4**) or build the auto recovery partition (see **Section B.3**)

Step 5: Create factory default image (see **Section B.2.5**)

The detailed descriptions are described in the following sections.

NOTE:

The setup procedures described below are for Microsoft Windows operating system users. For Linux, most of the setup procedures are the same except for several steps described in **Section B.3**.

B.2.1 Hardware and BIOS Setup

Step 1: Make sure the system is powered off and unplugged.

Step 2: Install a hard drive or SSD in the system. An unformatted and unpartitioned disk is recommended.

Step 3: Connect an optical disk drive to the system and insert the recovery CD.

Step 4: Turn on the system.

Step 5: Press the <**DELETE**> key as soon as the system is turned on to enter the BIOS.

Step 6: Select the connected optical disk drive as the 1st boot device. (**Boot → Boot Device Priority → 1st Boot Device**).

Step 7: Save changes and restart the computer. Continue to the next section for instructions on partitioning the internal storage.

B.2.2 Create Partitions

To create the system backup, the main storage device must be split into two partitions (three partitions for Linux). The first partition will be for the operating system, while the second partition will be invisible to the operating system and contain the backup made by the one key recovery software.

Step 1: Put the recovery CD in the optical drive of the system.

Step 2: **Boot the system from recovery CD**. When prompted, press any key to boot from the recovery CD. It will take a while to launch the recovery tool. Please be patient!

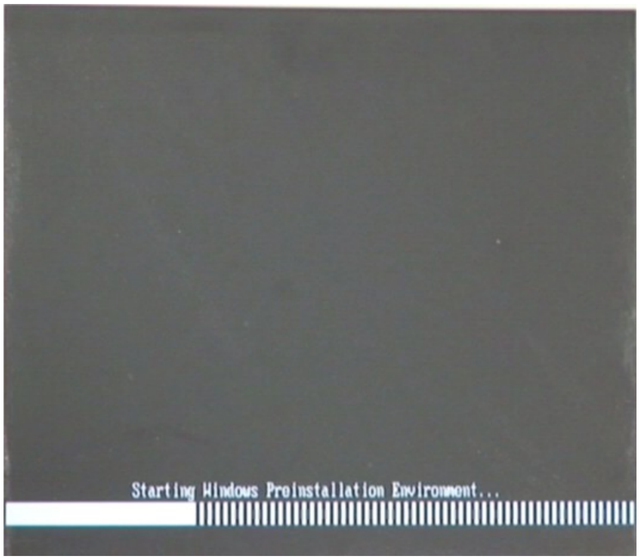


Figure B-2: Launching the Recovery Tool

Step 3: The recovery tool setup menu is shown as below.

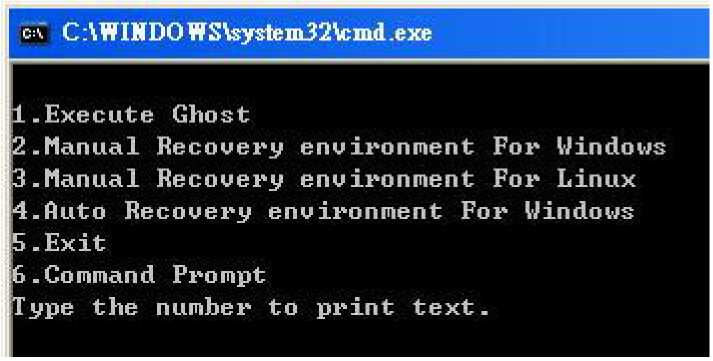


Figure B-3: Recovery Tool Setup Menu

Step 4: Press <**6**> then <Enter>.

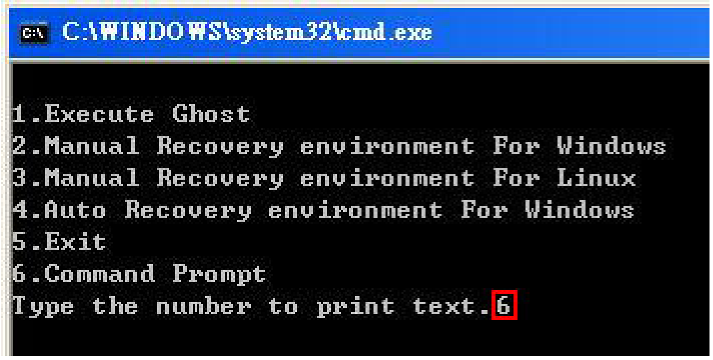


Figure B-4: Command Prompt

Step 5: The command prompt window appears. Type the following commands (marked in red) to create two partitions. One is for the OS installation; the other is for saving recovery files and images which will be an invisible partition.

(Press <Enter> after entering each line below)

system32>diskpart

DISKPART>list vol

DISKPART>sel disk 0

DISKPART>create part pri size= ___

DISKPART>assign letter=N

DISKPART>create part pri size= ___

DISKPART>assign letter=F

DISKPART>exit

system32>format N: /fs:ntfs /q /y

system32>format F: /fs:ntfs /q /v:Recovery /y

system32>exit

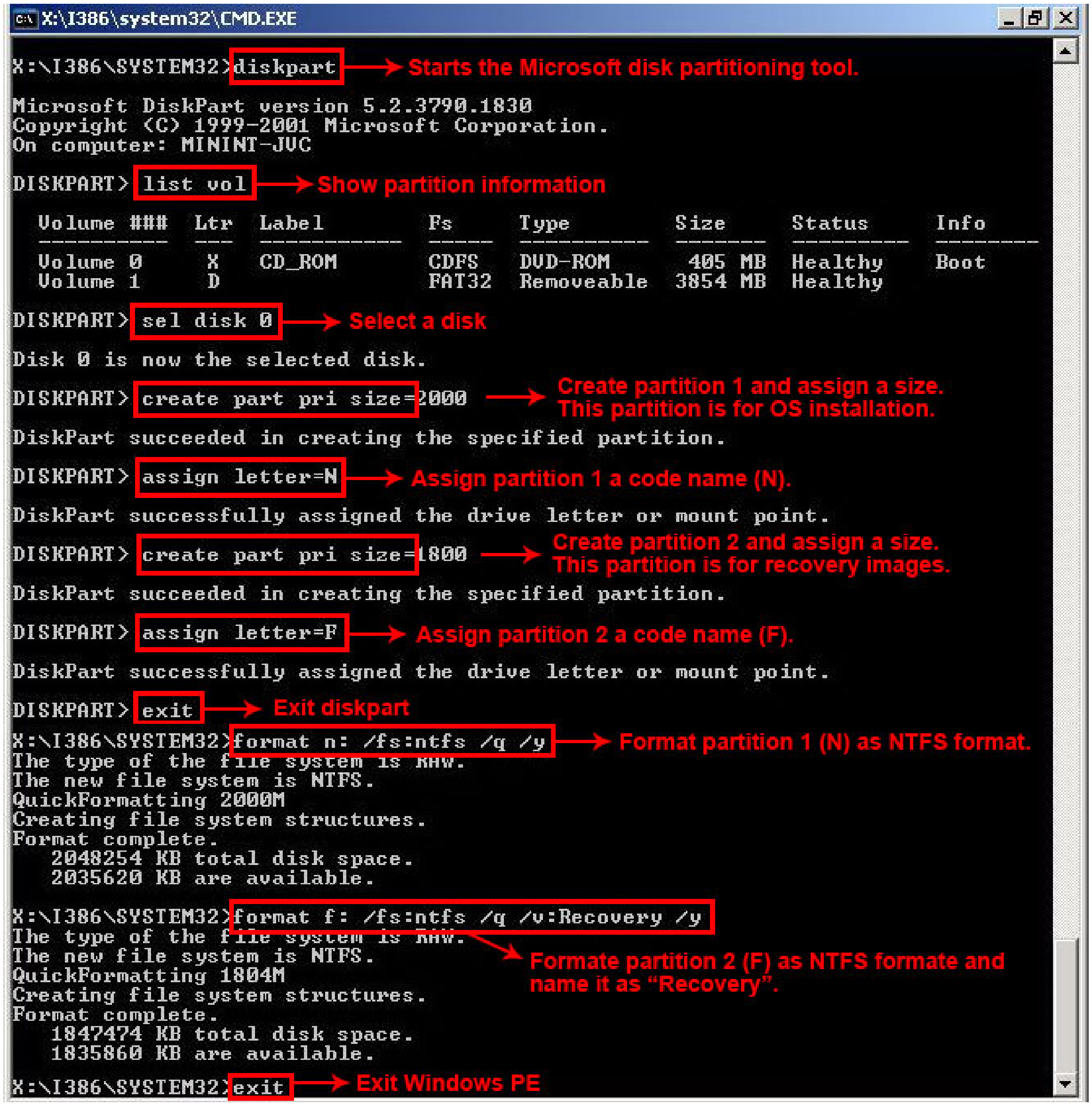
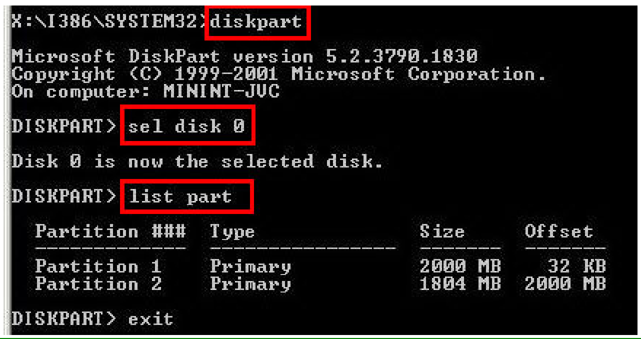


Figure B-5: Partition Creation Commands

NOTE:

Use the following commands to check if the partitions were created successfully.



```
X:\I386\SYSTEM32>diskpart

Microsoft DiskPart version 5.2.3790.1830
Copyright (C) 1999-2001 Microsoft Corporation.
On computer: MININT-JVC

DISKPART> sel disk 0

Disk 0 is now the selected disk.

DISKPART> list part

  Partition ###  Type              Size     Offset
  -------------  ----------------  -------  -------
  Partition 1    Primary           2000 MB    32 KB
  Partition 2    Primary           1804 MB  2000 MB

DISKPART> exit
```

Step 6: Press any key to exit the recovery tool and automatically reboot the system. Please continue to the following procedure: Build the Recovery Partition.

B.2.3 Install Operating System, Drivers and Applications

Install the operating system onto the unlabelled partition. The partition labeled "Recovery" is for use by the system recovery tool and should not be used for installing the operating system or any applications.

NOTE:

The operating system installation program may offer to reformat the chosen partition. DO NOT format the partition again. The partition has already been formatted and is ready for installing the new operating system.

To install the operating system, insert the operating system installation CD into the optical drive. Restart the computer and follow the installation instructions.

B.2.4 Building the Recovery Partition

Step 1: Put the recover CD in the optical drive.

Step 2: Start the system.

Step 3: **Boot the system from the recovery CD**. When prompted, press any key to boot from the recovery CD. It will take a while to launch the recovery tool. Please be patient!

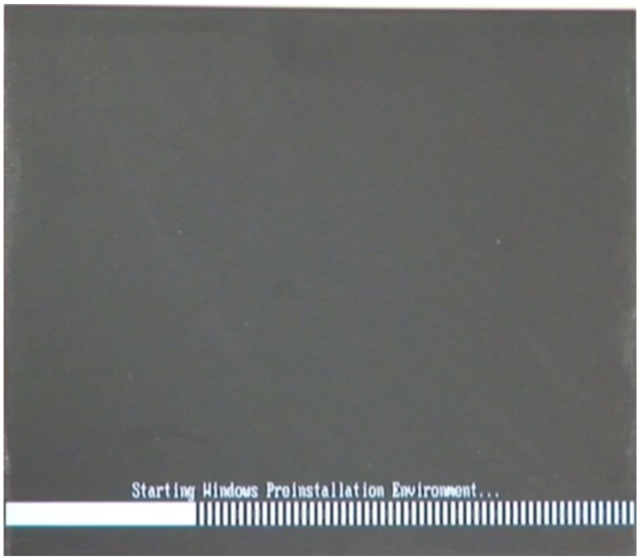


Figure B-6: Launching the Recovery Tool

Step 4: When the recovery tool setup menu appears, press <**2**> then <Enter>.

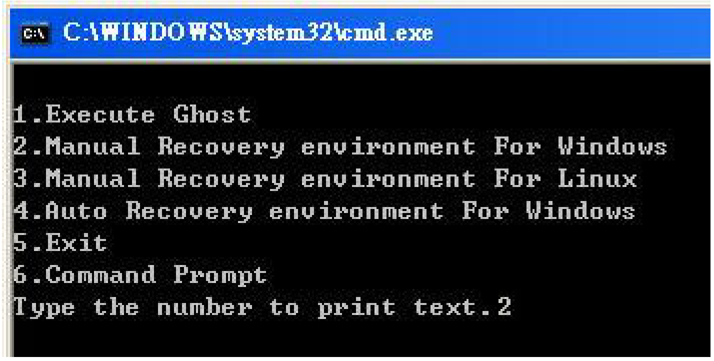


Figure B-7: Manual Recovery Environment for Windows

Step 5: The Symantec Ghost window appears and starts configuring the system to build a recovery partition. In this process the partition created for recovery files in **Section B.2.2** is hidden and the recovery tool is saved in this partition.

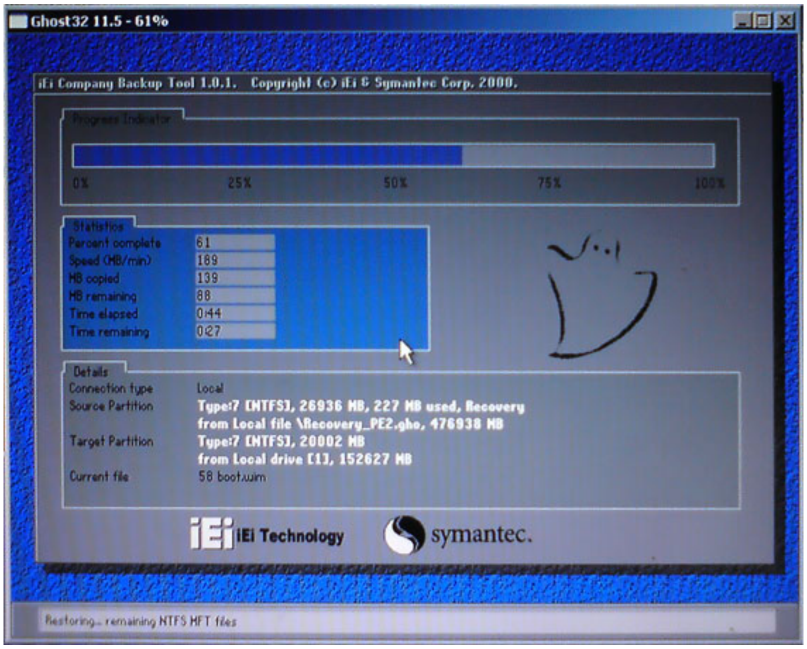


Figure B-8: Building the Recovery Partition

Step 6: After completing the system configuration, press any key in the following window to reboot the system.

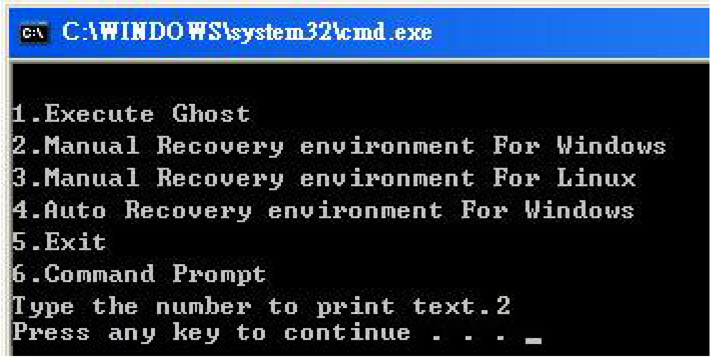


Figure B-9: Press Any Key to Continue

Step 7: Eject the recovery CD.

B.2.5 Create Factory Default Image

NOTE:

Before creating the factory default image, please configure the system to a factory default environment, including driver and application installations.

To create a factory default image, please follow the steps below.

Step 1: Turn on the system. When the following screen displays (**Figure B-10**), press the <**F3**> key to access the recovery tool. The message will display for 10 seconds, please press F3 before the system boots into the operating system.



Figure B-10: Press F3 to Boot into Recovery Mode

Step 2: The recovery tool menu appears. Type <**4**> and press <**Enter**>. (**Figure B-11**)

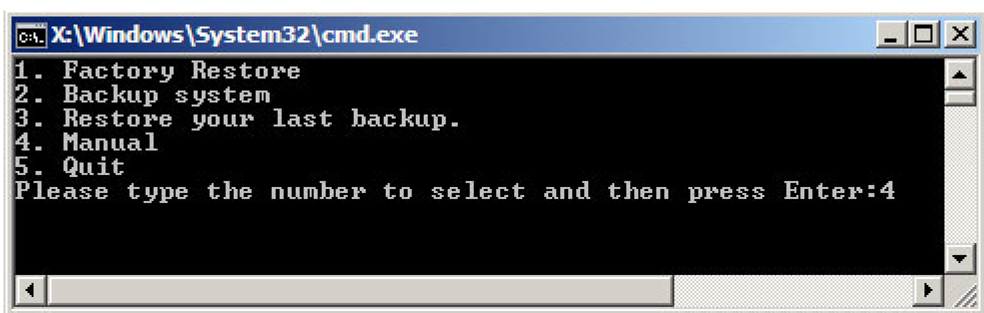


Figure B-11: Recovery Tool Menu

Step 3: The About Symantec Ghost window appears. Click **OK** button to continue.

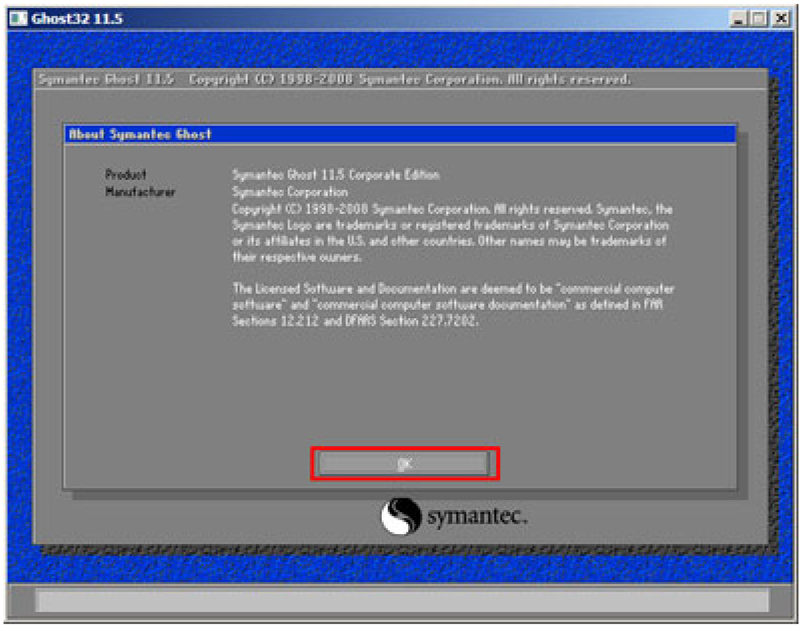


Figure B-12: About Symantec Ghost Window

Step 4: Use mouse to navigate to the option shown below (**Figure B-13**).

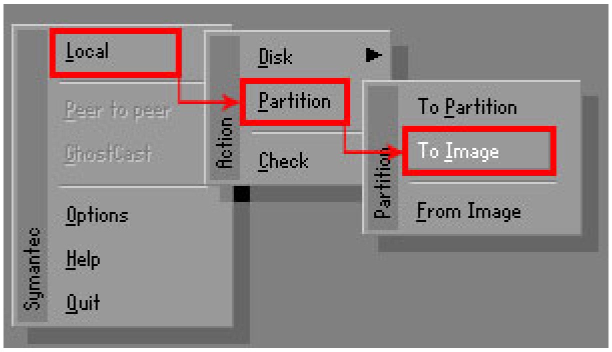


Figure B-13: Symantec Ghost Path

Step 5: Select the local source drive (Drive 1) as shown in **Figure B-14**. Then click OK.

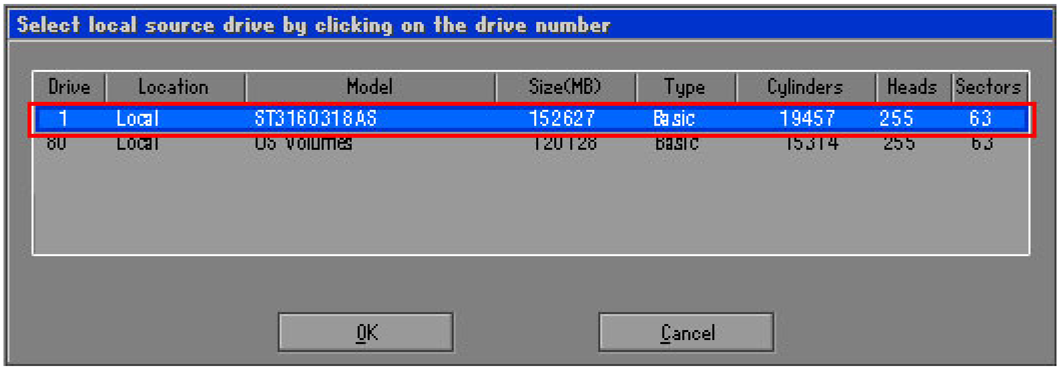


Figure B-14: Select a Local Source Drive

Step 6: Select a source partition (Part 1) from basic drive as shown in **Figure B-15**. Then click OK.

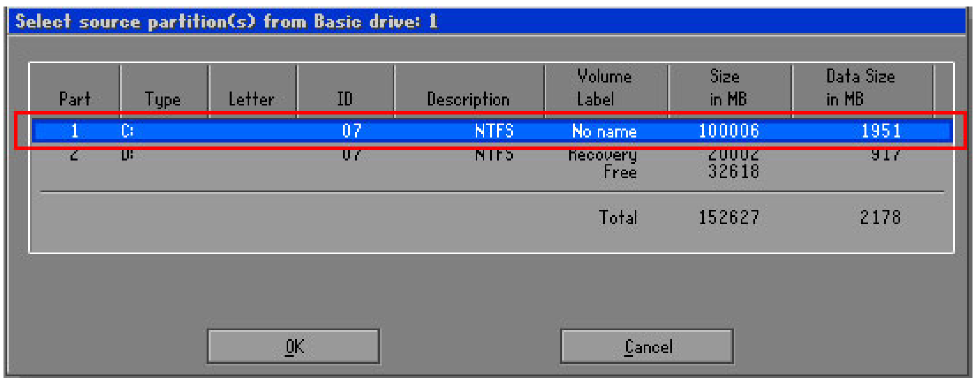


Figure B-15: Select a Source Partition from Basic Drive

Step 7: Select **1.2: [Recovery] NTFS drive** and enter a file name called **iei** (**Figure B-16**). Click **Save**. The factory default image will then be saved in the selected recovery drive and named IEI.GHO.

WARNING:

The file name of the factory default image must be **iei.GHO**.

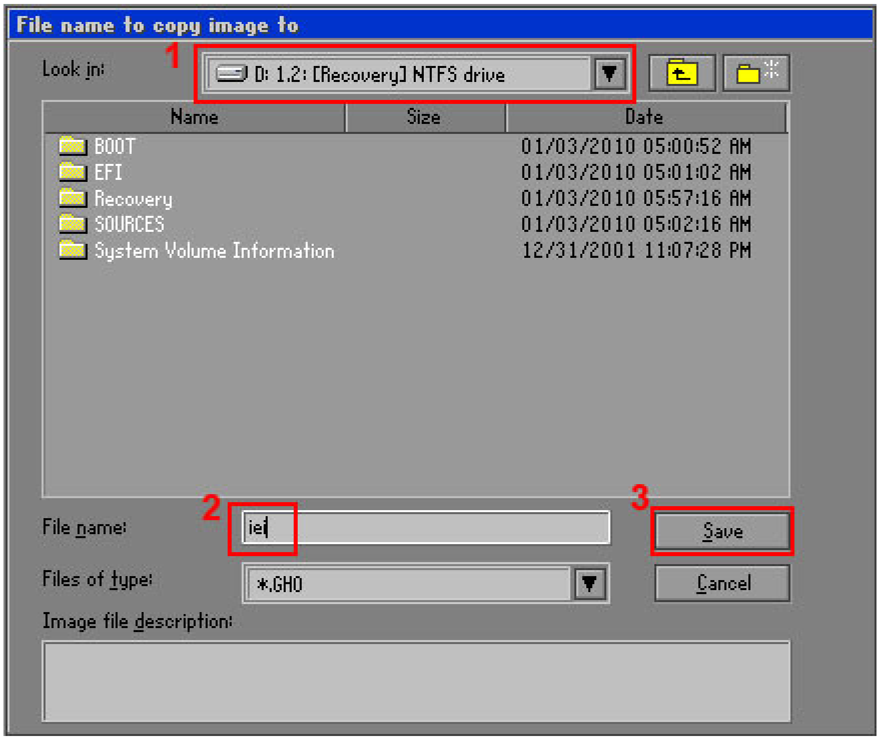


Figure B-16: File Name to Copy Image to

Step 8: When the Compress Image screen in **Figure B-17** prompts, click **High** to make the image file smaller.

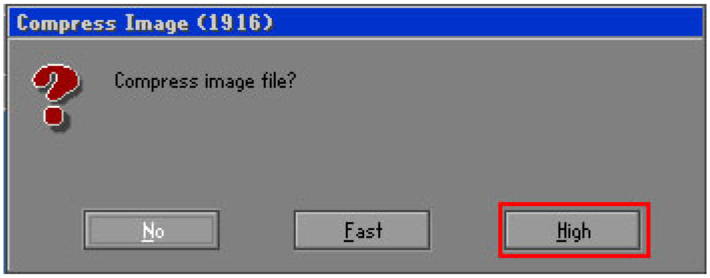


Figure B-17: Compress Image

Step 9: The Proceed with partition image creation window appears, click **Yes** to continue.

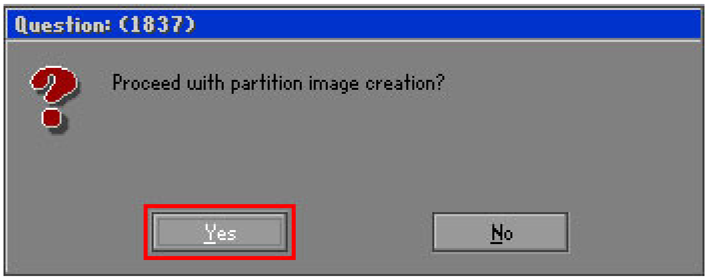


Figure B-18: Image Creation Confirmation

Step 10: The Symantec Ghost starts to create the factory default image (**Figure B-19**).

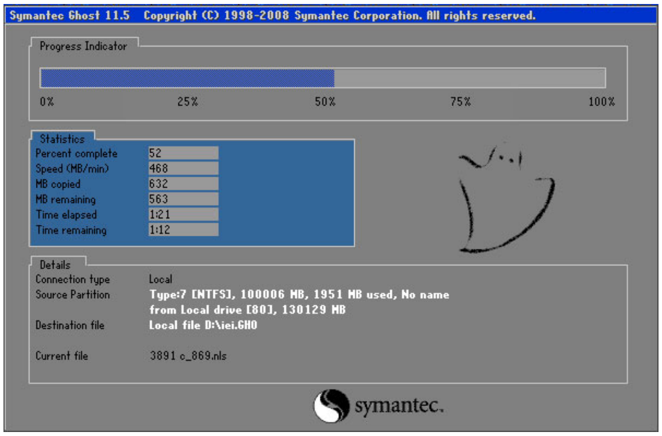


Figure B-19: Creating Image

Step 11: When the image creation completes, a screen prompts as shown in **Figure B-20**. Click **Continue** and close the Ghost window to exit the program.



Figure B-20: Image Creation Complete

Step 12: The recovery tool main menu window is shown as below. Press any key to reboot the system.

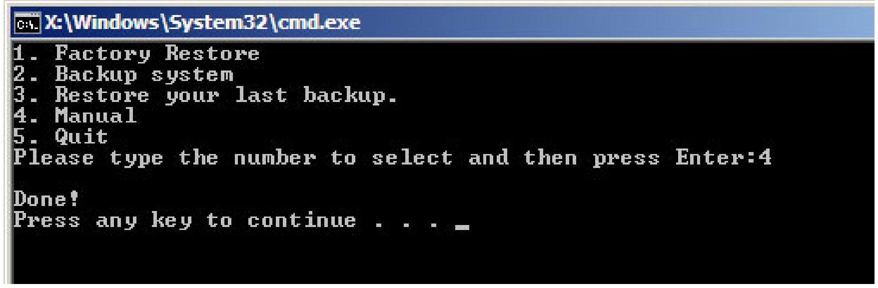


Figure B-21: Press Any Key to Continue

B.3 Auto Recovery Setup Procedure

The auto recovery function allows a system to automatically restore from the factory default image after encountering a Blue Screen of Death (BSoD) or a hang for around 10 minutes. To use the auto recovery function, follow the steps described in the following sections.

CAUTION:

The auto recovery function can only run on a Microsoft Windows system with the following OS versions:

- Windows 2000
- Windows XP
- Windows Vista
- Windows 7
- Windows XP Embedded
- Windows Embedded Standard 7

CAUTION:

The setup procedure may include a step to create a factory default image. It is suggested to configure the system to a factory default environment before the configuration, including driver and application installations.

Step 1: Follow the steps described in **Section B.2.1 ~ Section B.2.3** to setup BIOS, create partitions and install operating system.

Step 2: Install the auto recovery utility into the system by double clicking the **Utility/AUTORECOVERY-SETUP.exe** in the One Key Recovery CD. This utility MUST be installed in the system, otherwise, the system will automatically restore from the factory default image every ten (10) minutes.



Figure B-22: Auto Recovery Utility

Step 3: **Disable the automatically restart function before creating the factory default image**. Go to: My Computer → Properties → Advanced. Click the Settings button of Startup and Recovery. Deselect "Automatically restart". Click OK to save the settings and exit. (See Figure B-23)

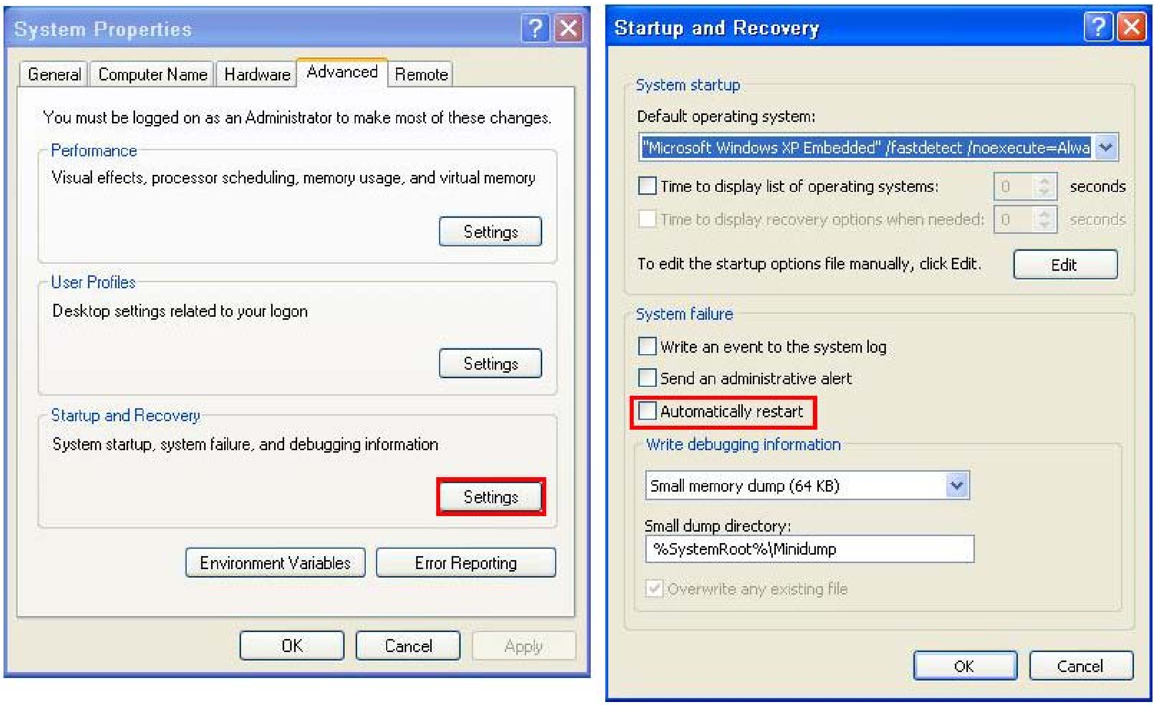


Figure B-23: Disable Automatically Restart

Step 4: Reboot the system from the recovery CD. When prompted, press any key to boot from the recovery CD. It will take a while to launch the recovery tool. Please be patient!

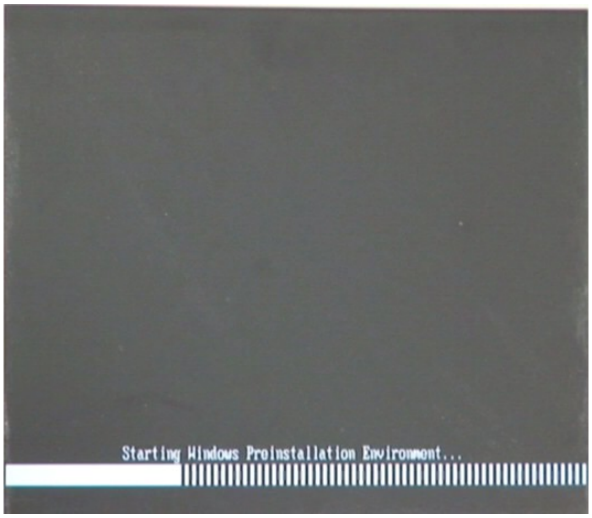


Figure B-24: Launching the Recovery Tool

Step 5: When the recovery tool setup menu appears, press <**4**> then <Enter>.

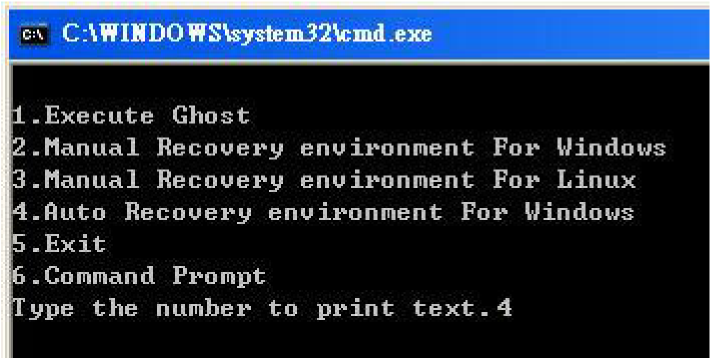


Figure B-25: Auto Recovery Environment for Windows

Step 6: The Symantec Ghost window appears and starts configuring the system to build an auto recovery partition. In this process the partition created for recovery files in **Section B.2.2** is hidden and the auto recovery tool is saved in this partition.

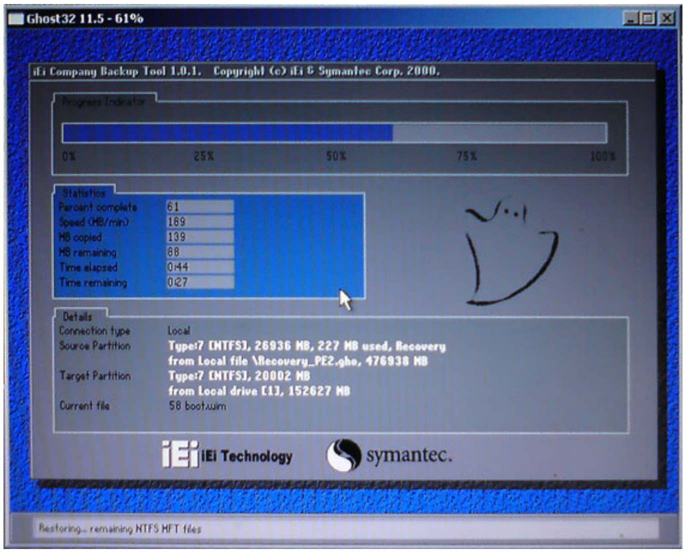


Figure B-26: Building the Auto Recovery Partition

Step 7: After completing the system configuration, the following message prompts to confirm whether to create a factory default image. Type **Y** to have the system create a factory default image automatically. Type **N** within 6 seconds to skip this process (The default option is YES). It is suggested to choose YES for this option.



Figure B-27: Factory Default Image Confirmation

Step 8: The Symantec Ghost starts to create the factory default image (**Figure B-28**).

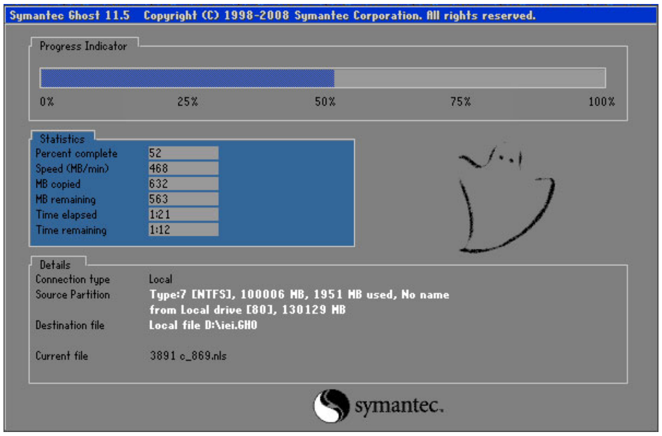


Figure B-28: Creating Image

Step 9: After completing the system configuration, press any key in the following window to restart the system.

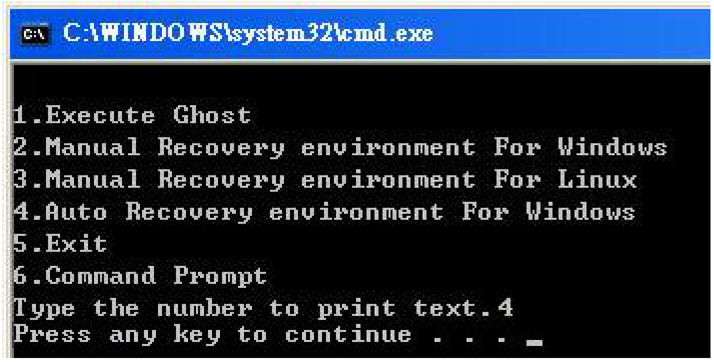


Figure B-29: Press Any Key to Continue

Step 10: Eject the One Key Recovery CD and restart the system.

Step 11: Press the <**DELETE**> key as soon as the system is turned on to enter the BIOS.

Step 12: Enable the Auto Recovery Function option (**Advanced → iEi Feature → Auto Recovery Function**).

```
                         BIOS SETUP UTILITY
  Main   Advanced   PCIPNP    Boot   Security  Chipset   Exit

iEi Feature
____________________________________________
Auto Recovery Function              [Enabled]
  Recover from PXE                  [Disabled]



                                                ←→    Select Screen
                                                ↑ ↓   Select Item
                                                Enter Go to SubScreen
                                                F1    General Help
                                                F10   Save and Exit
                                                ESC   Exit

          v02.61 ©Copyright 1985-2006, American Megatrends, Inc.
```

Figure B-30: IEI Feature BIOS Menu

Step 13: Save changes and restart the system. If the system encounters a Blue Screen of Death (BSoD) or a hang for around 10 minutes, it will automatically restore from the factory default image.

B.4 Setup Procedure for Linux

The initial setup procedure for Linux system is mostly the same with the procedure for Microsoft Windows. Please follow the steps below to setup recovery tool for Linux OS.

Step 1: **Hardware and BIOS setup**. Refer to **Section B.2.1**.

Step 2: **Install Linux operating system**. Make sure to install GRUB (v0.97 or earlier) MBR type and Ext3 partition type. Leave enough space on the hard drive to create the recover partition later.

NOTE:

If the Linux OS is not installed with GRUB (v0.97 or earlier) and Ext3, the Symantec Ghost may not function properly.

While installing Linux OS, please create two partitions:

- Partition 1: **/**
- Partition 2: **SWAP**

NOTE:

Please reserve enough space for partition 3 for saving recovery images.

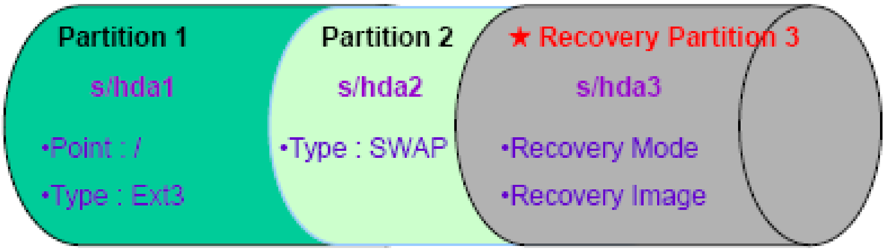


Figure B-31: Partitions for Linux

Step 3: **Create a recovery partition**. Insert the recovery CD into the optical disk drive. Follow **Step 1** ~ **Step 3** described in **Section B.2.2**. Then type the following commands (marked in red) to create a partition for recovery images.

system32>diskpart

DISKPART>list vol

DISKPART>sel disk 0

DISKPART>create part pri size= ___

DISKPART>assign letter=N

DISKPART>exit

system32>format N: /fs:ntfs /q /v:Recovery /y

system32>exit

Step 4: **Build the recovery partition**. Press any key to boot from the recovery CD. It will take a while to launch the recovery tool. Please be patient. When the recovery tool setup menu appears, type <**3**> and press <Enter> (**Figure B-32**). The Symantec Ghost window appears and starts configuring the system to build a

recovery partition. After completing the system configuration, press any key to reboot the system. Eject the recovery CD.

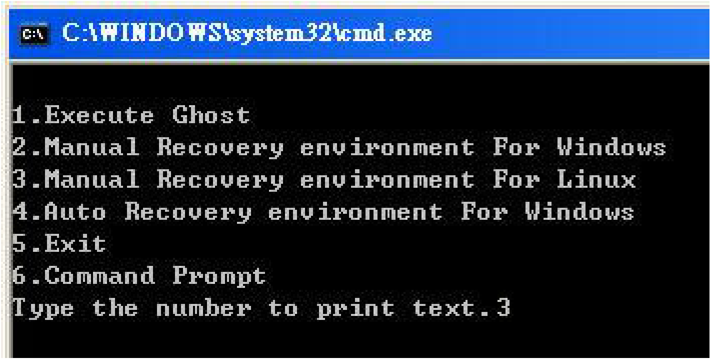


Figure B-32: Manual Recovery Environment for Linux

Step 5: **Access the recovery tool main menu by modifying the "menu.lst"**. To first access the recovery tool main menu, the menu.lst must be modified. In Linux, enter Administrator (root). When prompt appears, type:

cd /boot/grub

vi menu.lst

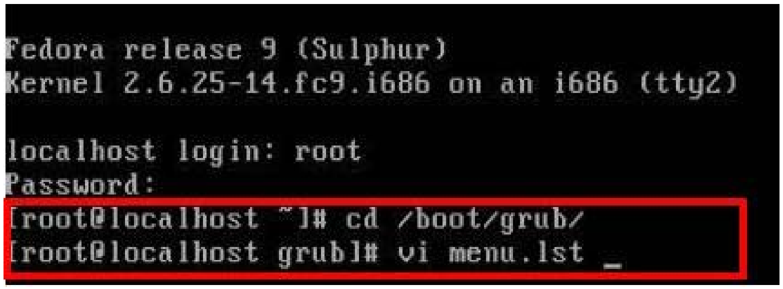
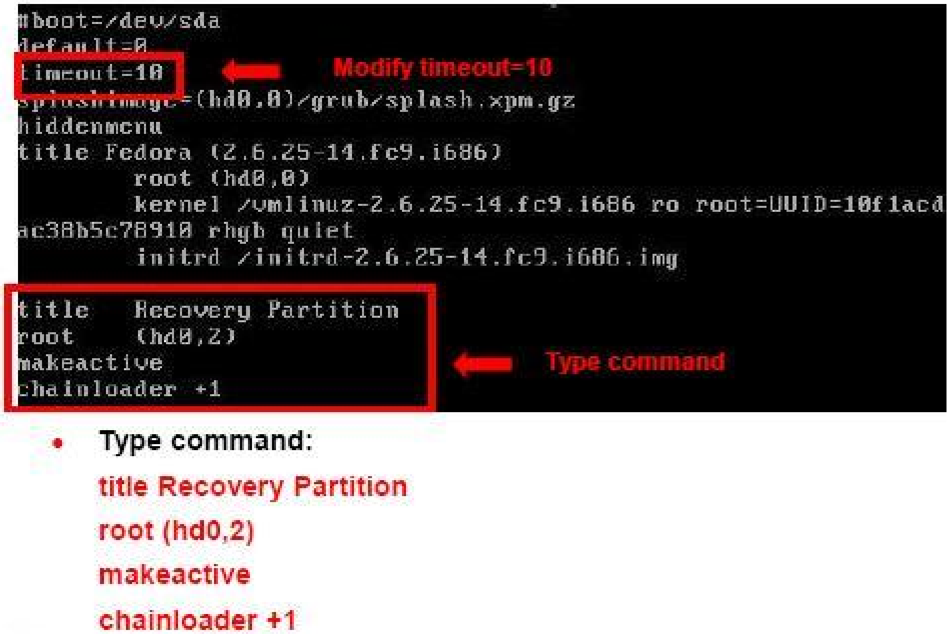


Figure B-33: Access menu.lst in Linux (Text Mode)

Step 6: Modify the menu.lst as shown below.



Step 7: The recovery tool menu appears. (**Figure B-34**)



Figure B-34: Recovery Tool Menu

Step 8: **Create a factory default image**. Follow **Step 2** ~ **Step 12** described in **Section B.2.5** to create a factory default image.

B.5 Recovery Tool Functions

After completing the initial setup procedures as described above, users can access the recovery tool by pressing <**F3**> while booting up the system. However, if the setup procedure in Section B.3 has been completed and the auto recovery function is enabled, the system will automatically restore from the factory default image without pressing the F3 key. The recovery tool main menu is shown below.



Figure B-35: Recovery Tool Main Menu

The recovery tool has several functions including:

1. **Factory Restore**: Restore the factory default image (iei.GHO) created in Section B.2.5.
2. **Backup system**: Create a system backup image (iei_user.GHO) which will be saved in the hidden partition.
3. **Restore your last backup**: Restore the last system backup image
4. **Manual**: Enter the Symantec Ghost window to configure manually.
5. **Quit**: Exit the recovery tool and restart the system.

WARNING:

Please do not turn off the system power during the process of system recovery or backup.

WARNING:

All data in the system will be deleted during the system recovery. Please backup the system files before restoring the system (either Factory Restore or Restore Backup).

B.5.1 Factory Restore

To restore the factory default image, please follow the steps below.

Step 1: Type <**1**> and press <**Enter**> in the main menu.

Step 2: The Symantec Ghost window appears and starts to restore the factory default. A factory default image called **iei.GHO** is created in the hidden Recovery partition.

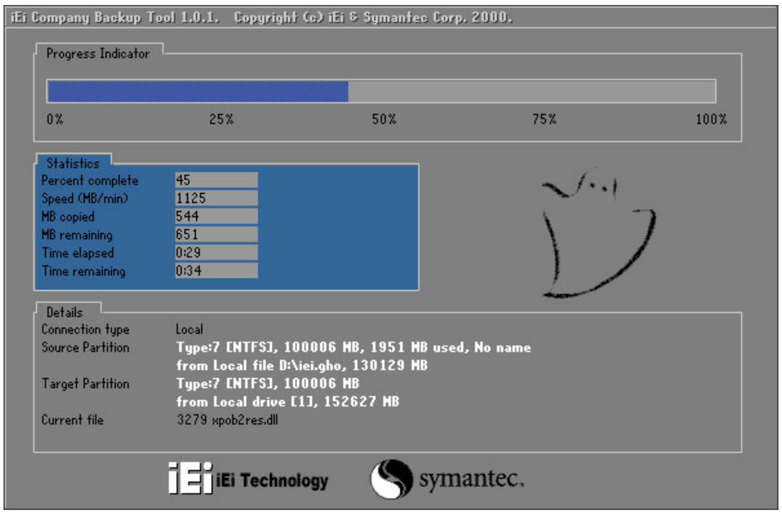


Figure B-36: Restore Factory Default

Step 3: The screen shown in **Figure B-37** appears when completed. Press any key to reboot the system.

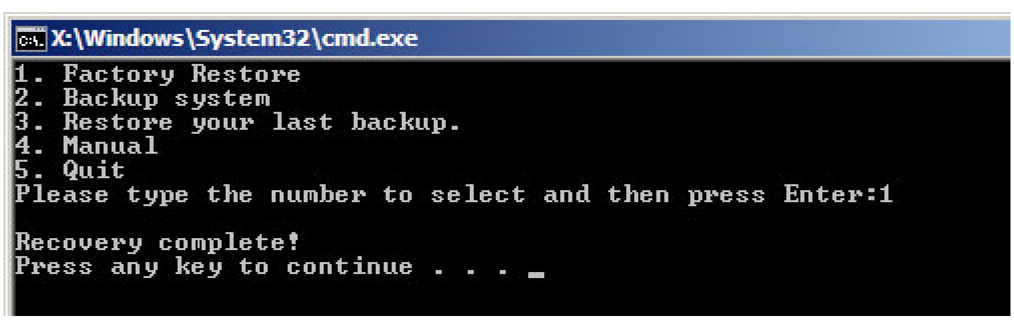


Figure B-37: Recovery Complete Window

B.5.2 Backup System

To backup the system, please follow the steps below.

Step 1: Type <**2**> and press <**Enter**> in the main menu.

Step 2: The Symantec Ghost window appears and starts to backup the system. A backup image called **iei_user.GHO** is created in the hidden Recovery partition.

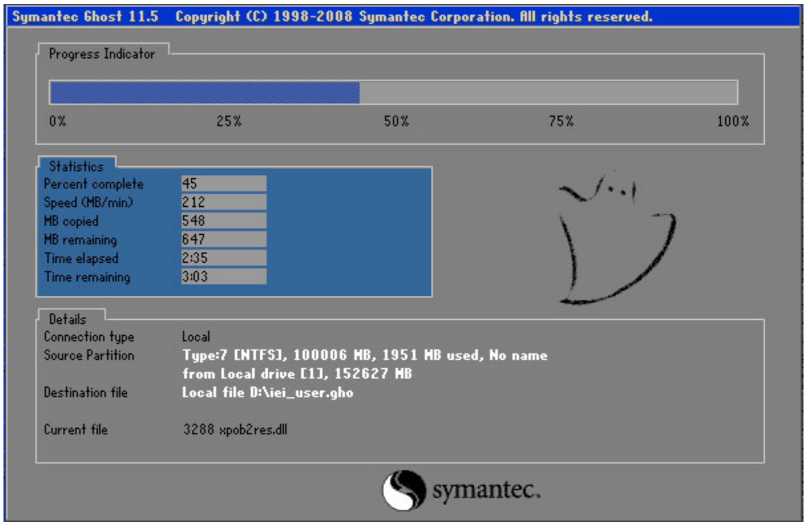


Figure B-38: Backup System

Step 3: The screen shown in **Figure B-39** appears when system backup is complete. Press any key to reboot the system.

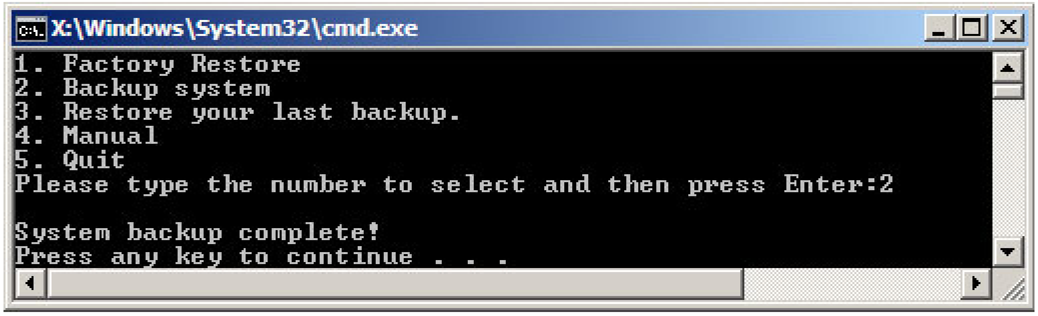


Figure B-39: System Backup Complete Window

B.5.3 Restore Your Last Backup

To restore the last system backup, please follow the steps below.

Step 1: Type <**3**> and press <**Enter**> in the main menu.

Step 2: The Symantec Ghost window appears and starts to restore the last backup image (iei_user.GHO).

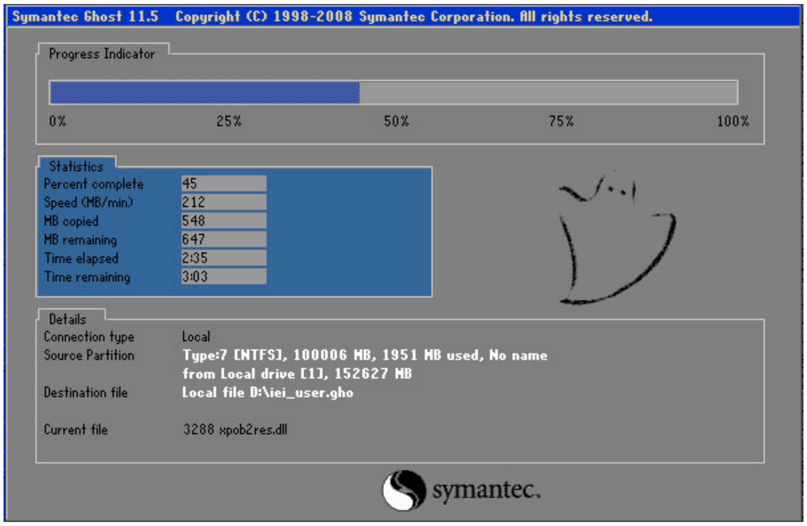


Figure B-40: Restore Backup

Step 3: The screen shown in **Figure B-41** appears when backup recovery is complete. Press any key to reboot the system.

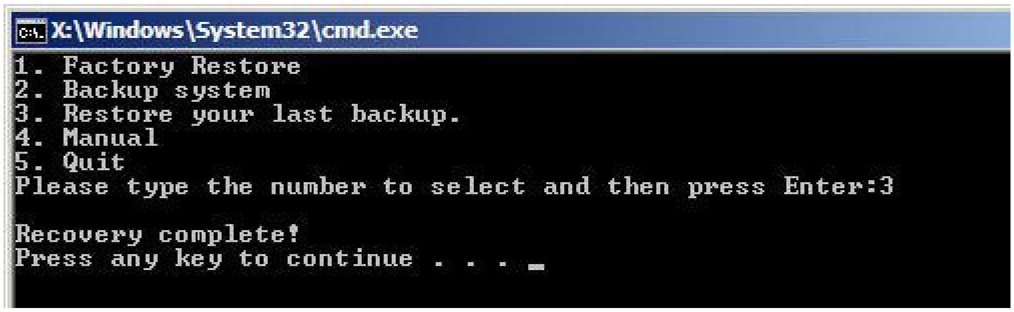


Figure B-41: Restore System Backup Complete Window

B.5.4 Manual

To restore the last system backup, please follow the steps below.

Step 1: Type <**4**> and press <**Enter**> in the main menu.

Step 2: The Symantec Ghost window appears. Use the Ghost program to backup or recover the system manually.

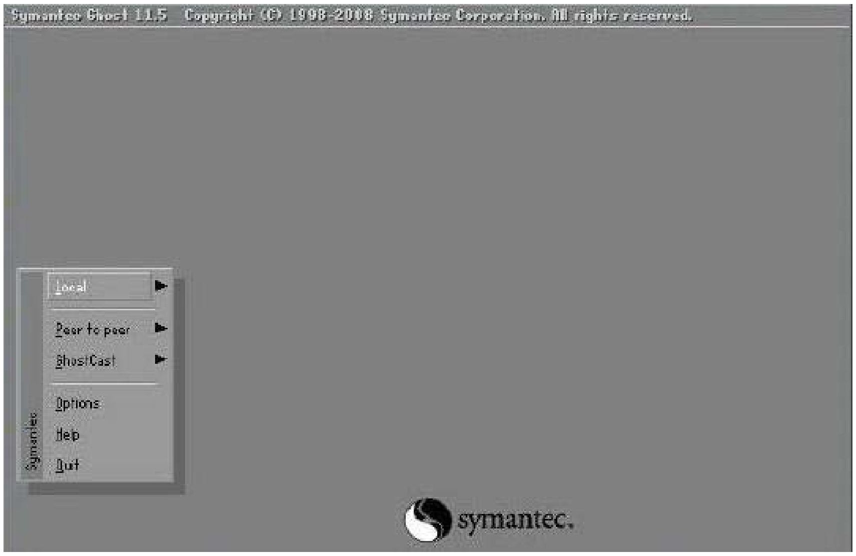
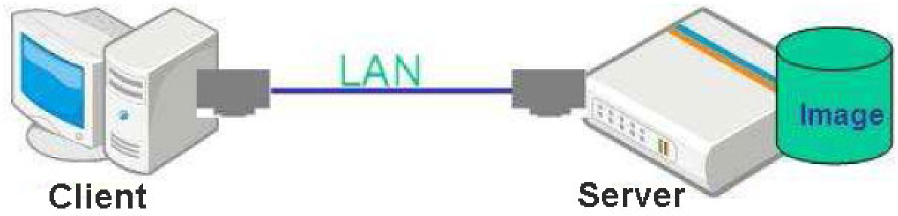


Figure B-42: Symantec Ghost Window

Step 3: When backup or recovery is completed, press any key to reboot the system.

B.6 Restore Systems from a Linux Server through LAN

The One Key Recovery allows a client system to automatically restore to a factory default image saved in a Linux system (the server) through LAN connectivity after encountering a Blue Screen of Death (BSoD) or a hang for around 10 minutes. To be able to use this function, the client system and the Linux system MUST reside in the same domain.



CAUTION:

The supported client OS includes:

- Windows 2000
- Windows XP
- Windows Vista
- Windows 7
- Windows XP Embedded
- Windows Embedded Standard 7

Prior to restoring client systems from a Linux server, a few setup procedures are required.

Step 1: Configure DHCP server settings

Step 2: Configure TFTP settings

Step 3: Configure One Key Recovery server settings

Step 4: Start DHCP, TFTP and HTTP

Step 5: Create a shared directory

Step 6: Setup a client system for auto recovery

The detailed descriptions are described in the following sections. In this document, two types of Linux OS are used as examples to explain the configuration process – CentOS 5.5 (Kernel 2.6.18) and Debian 5.0.7 (Kernel 2.6.26).

B.6.1 Configure DHCP Server Settings

Step 1: Install the DHCP

#yum install dhcp (CentOS, commands marked in red)

#apt-get install dhcp3-server (Debian, commands marked in blue)

Step 2: Confirm the operating system default settings: dhcpd.conf.

CentOS

Use the following command to show the DHCP server sample location:

#vi /etc/dhcpd.conf

The DHCP server sample location is shown as below:

```
#
# DHCP Server Configuration file.
#   see /usr/share/doc/dhcp*/dhcpd.conf.sample
#
```

Use the following command to copy the DHCP server sample to etc/dhcpd.conf:

#cp /usr/share/doc/dhcp-3.0.5/dhcpd.conf.sample /etc/dhcpd.conf

#vi /etc/dhcpd.conf

```
ddns-update-style interim;
ignore client-updates;

subnet 192.168.0.0 netmask 255.255.255.0 {

# --- default gateway
        option routers                  192.168.0.2;
        option subnet-mask              255.255.255.0;

        option nis-domain               "domain.org";
        option domain-name              "domain.org";
        option domain-name-servers      192.168.0.1;
        next-server 192.168.0.6;
        filename "pxelinux.0";
        option time-offset              -18000; # Eastern Standard Time
#       option ntp-servers              192.168.1.1;
```

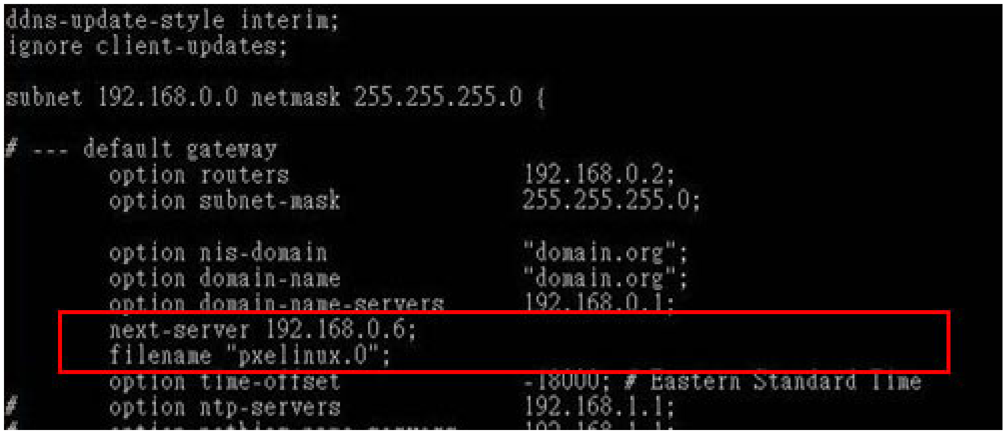
Debian

#vi /etc/dhcpd.conf

Edit "/etc/dhcpd.conf" for your environment. For example, add

next-server PXE server IP address;

filename “pxelinux.0”;



B.6.2 Configure TFTP Settings

Step 1: Install the tftp, httpd and syslinux.

#yum install tftp-server httpd syslinux (CentOS)

#apt-get install tftpd-hpa xinetd syslinux (Debian)

Step 2: Enable the TFTP server by editing the “/etc/xinetd.d/tftp” file and make it use the remap file. The “-vvv” is optional but it could definitely help on getting more information while running the remap file. For example:

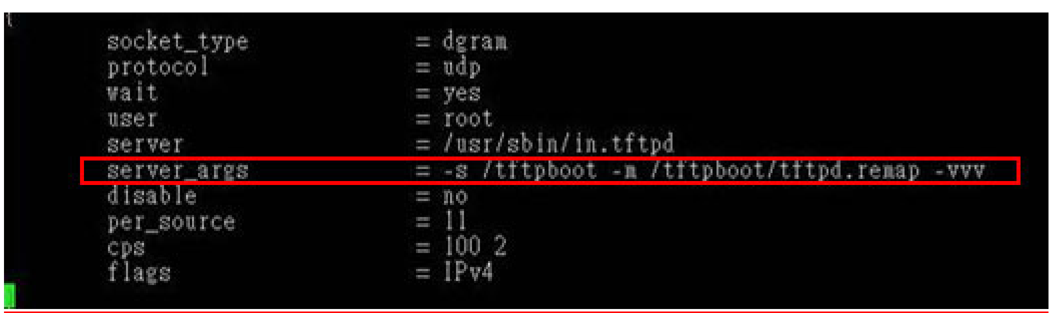
CentOS

#vi /etc/xinetd.d/tftp

Modify:

disable = no

server_args = -s /tftpboot –m /tftpboot/tftpd.remap -vvv

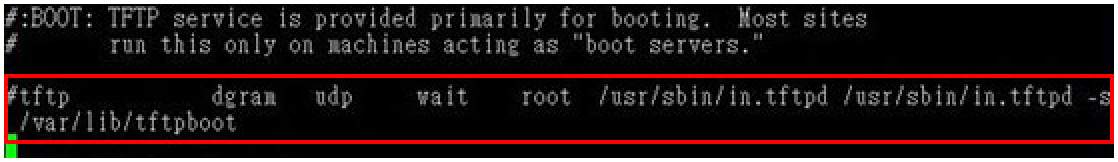


Debian

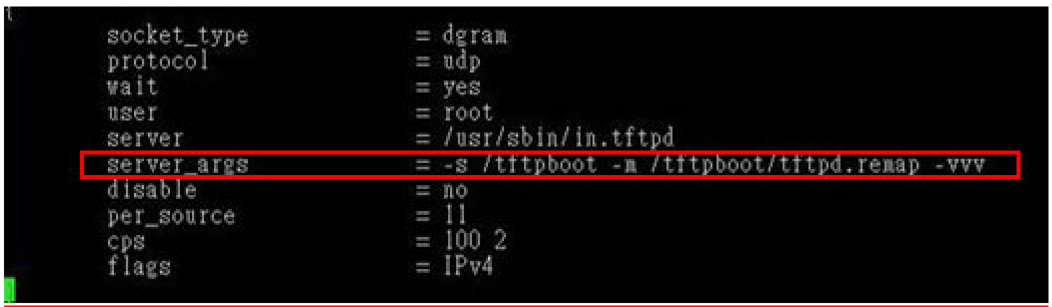
Replace the TFTP settings from “inetd” to “xinetd” and annotate the “inetd” by adding “#”.

#vi /etc/inetd.conf

Modify: #tftp dgram udp wait root /usr/sbin....... (as shown below)



#vi /etc/xinetd.d/tftp



B.6.3 Configure One Key Recovery Server Settings

Step 1: Copy the **Utility/RECOVERYR10.TAR.BZ2** package from the One Key Recovery CD to the system (server side).



Step 2: Extract the recovery package to /.

#cp RecoveryR10.tar.bz2 /

#cd /

#tar –xvjf RecoveryR10.tar.bz2

Step 3: Copy “pxelinux.0” from “syslinux” and install to “/tftboot”.

#cp /usr/lib/syslinux/pxelinux.0 /tftpboot/

B.6.4 Start the DHCP, TFTP and HTTP

Start the DHCP, TFTP and HTTP. For example:

CentOS

#service xinetd restart

#service httpd restart

#service dhcpd restart

Debian

#/etc/init.d/xinetd reload

#/etc/init.d/xinetd restart

#/etc/init.d/dhcp3-server restart

B.6.5 Create Shared Directory

Step 1: Install the samba.

#yum install samba

Step 2: Create a shared directory for the factory default image.

#mkdir /share

#cd /share

#mkdir /image

#cp iei.gho /image

WARNING:

The file name of the factory default image must be **iei.gho**.

Step 3: Confirm the operating system default settings: smb.conf.

#vi /etc/samba/smb.conf

Modify:

[image]

comment = One Key Recovery

path = /share/image

browseable = yes

writable = yes

public = yes

create mask = 0644

directory mask = 0755

Step 4: Edit "/etc/samba/smb.conf" for your environment. For example:

```
# "security = user" is always a good idea. This will require a Unix account
# in this server for every user accessing the server. See
# /usr/share/doc/samba-doc/htmldocs/Samba3-HOWTO/ServerType.html
# in the samba-doc package for details.
  security = share
```

```
[image]
   comment = One Key Recovery
   path = /share/image
   browseable = yes
   writable = yes
   public = yes
   create mask = 0644
   directory mask = 0755
```

Step 5: Modify the hostname

#vi /etc/hostname

Modify: RecoveryServer

```
RecoveryServer
~
```

B.6.6 Setup a Client System for Auto Recovery

Step 1: **Disable the automatically restart function before creating the factory default image**. Go to: My Computer → Properties → Advanced. Click the Settings button of Startup and Recovery. Deselect "Automatically restart". Click OK to save the settings and exit. (See Figure B-23)

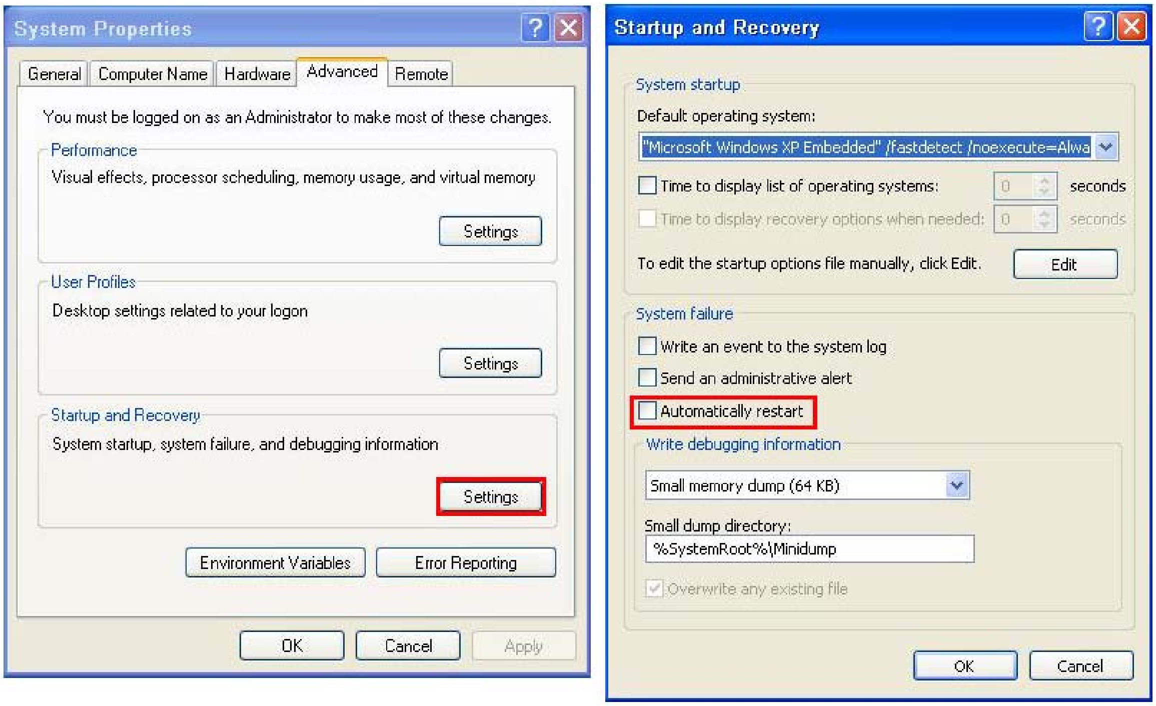


Figure B-43: Disable Automatically Restart

Step 2: Configure the following BIOS options of the client system.

Advanced → iEi Feature → Auto Recovery Function → **Enabled**

Advanced → iEi Feature → Recover from PXE → **Enabled**

Boot → Launch PXE OpROM → **Enabled**

Step 3: Continue to configure the **Boot Option Priorities** BIOS option of the client system:

Boot Option #1 → remain the default setting to boot from the original OS.

Boot Option #2 → select the boot from LAN option.

Step 4: Save changes and exit BIOS menu.

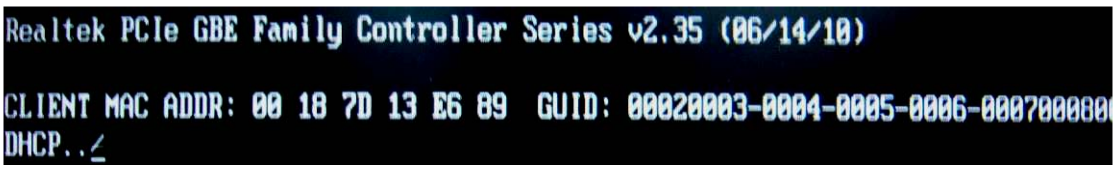
Exit → **Save Changes and Exit**

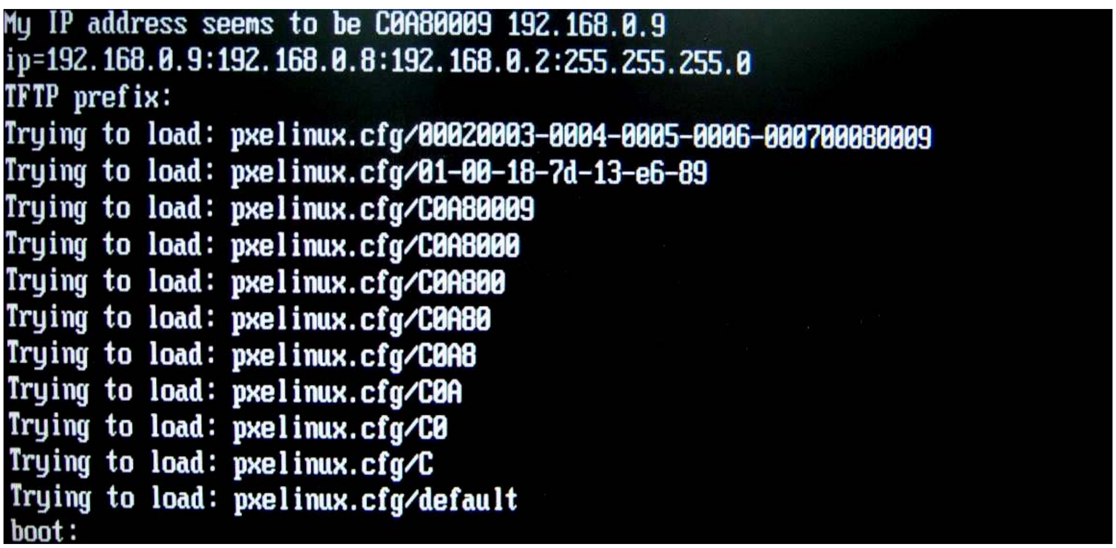
Step 5: Install the auto recovery utility into the system by double clicking the **Utility/AUTORECOVERY-SETUP.exe** in the One Key Recovery CD. This utility

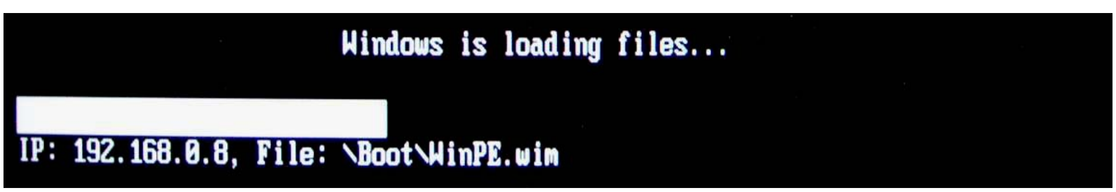
MUST be installed in the system, otherwise, the system will automatically restore from the factory default image every ten (10) minutes.

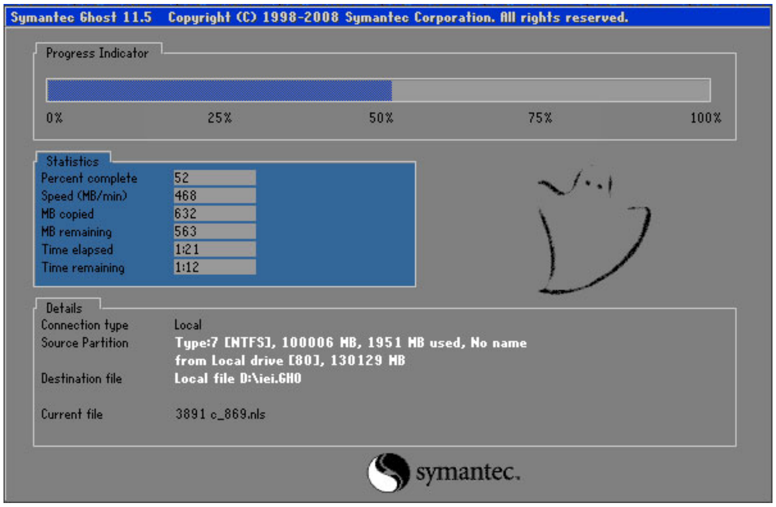


Step 6: Restart the client system from LAN. If the system encounters a Blue Screen of Death (BSoD) or a hang for around 10 minutes, it will automatically restore from the factory default image. The following screens will show when the system starts auto recovering.









NOTE:

A firewall or a SELinux is not in use in the whole setup process described above. If there is a firewall or a SELinux protecting the system, modify the configuration information to accommodate them.

B.7 Other Information

B.7.1 Using AHCI Mode or ALi M5283 / VIA VT6421A Controller

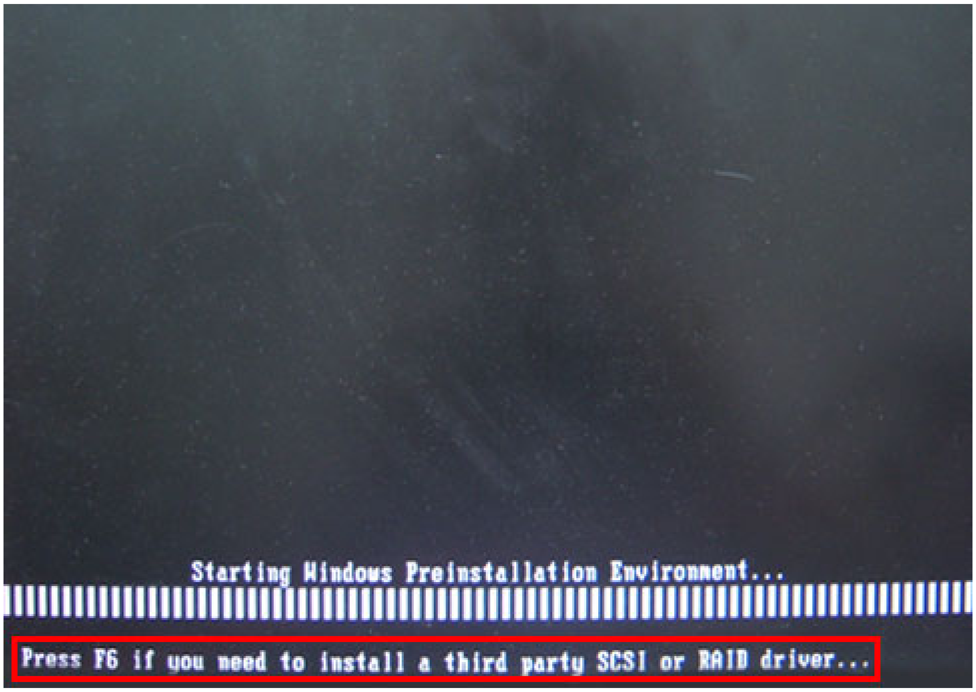
When the system uses AHCI mode or some specific SATA controllers such as ALi M5283 or VIA VT6421A, the SATA RAID/AHCI driver must be installed before using one key recovery. Please follow the steps below to install the SATA RAID/AHCI driver.

Step 1: Copy the SATA RAID/AHCI driver to a floppy disk and insert the floppy disk into a USB floppy disk drive. The SATA RAID/AHCI driver must be especially designed for the on-board SATA controller.

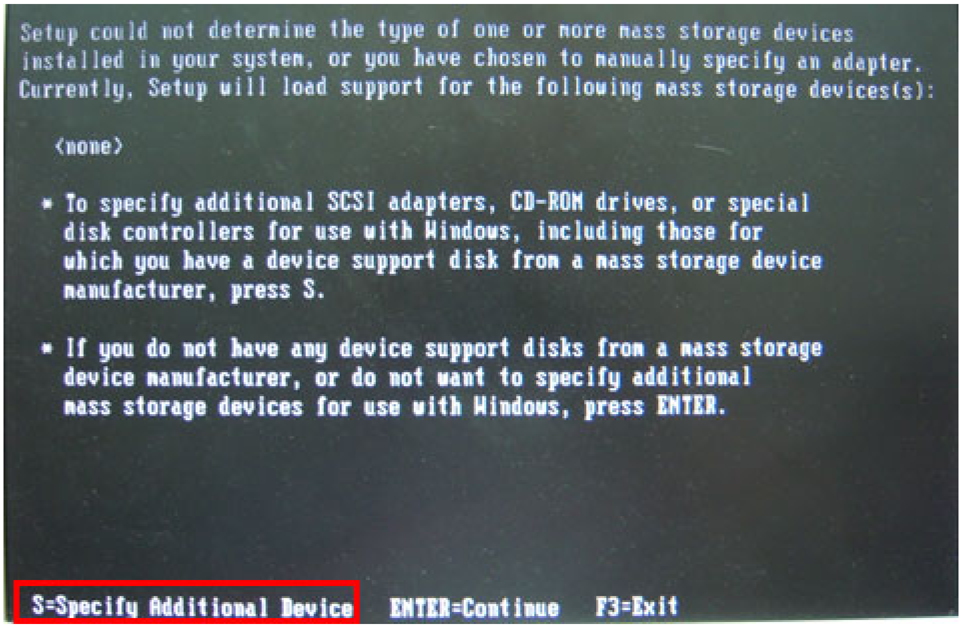
Step 2: Connect the USB floppy disk drive to the system.

Step 3: Insert the One Key Recovery CD into the system and boot the system from the CD.

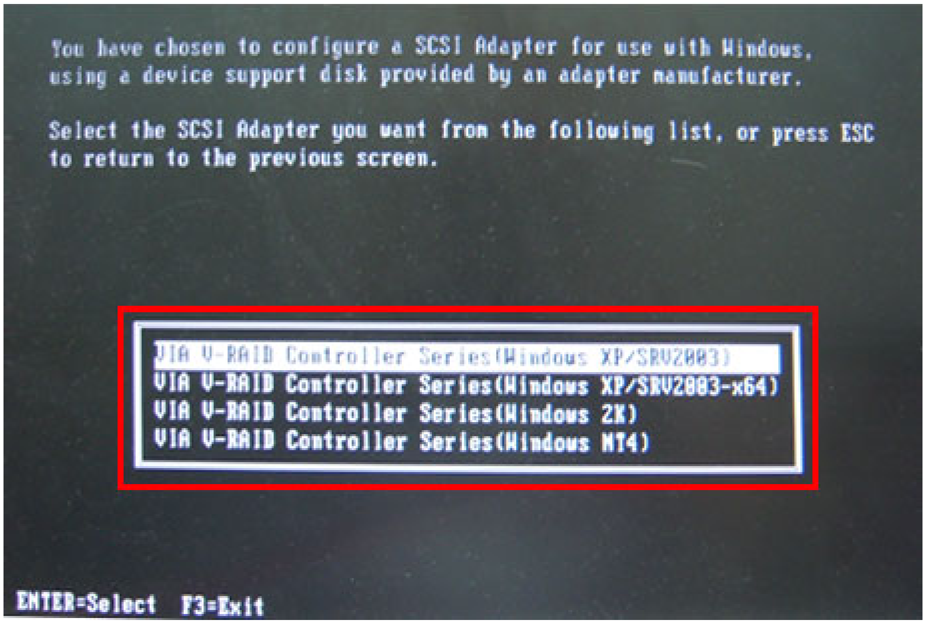
Step 4: When launching the recovery tool, press <**F6**>.



Step 5: When the following window appears, press <**S**> to select “Specify Additional Device”.



Step 6: In the following window, select a SATA controller mode used in the system. Then press <**Enter**>. The user can now start using the SATA HDD.



Step 7: After pressing <Enter>, the system will get into the recovery tool setup menu. Continue to follow the setup procedure from **Step 4** in **Section B.2.2 Create Partitions** to finish the whole setup process.

B.7.2 System Memory Requirement

To be able to access the recovery tool by pressing <**F3**> while booting up the system, please make sure to have enough system memory. The minimum memory requirement is listed below.

- **Using Award BIOS**: 128 MB system memory
- **Using AMI BIOS**: 512 MB system memory.

Appendix

C

Terminology

AC ’97	Audio Codec 97 (AC’97) refers to a codec standard developed by Intel® in 1997.
ACPI	Advanced Configuration and Power Interface (ACPI) is an OS-directed configuration, power management, and thermal management interface.
AHCI	Advanced Host Controller Interface (AHCI) is a SATA Host controller register-level interface.
ATA	The Advanced Technology Attachment (ATA) interface connects storage devices including hard disks and CD-ROM drives to a computer.
APM	The Advanced Power Management (APM) application program interface (API) enables the inclusion of power management in the BIOS.
ARMD	An ATAPI Removable Media Device (ARMD) is any ATAPI device that supports removable media, besides CD and DVD drives.
ASKIR	Amplitude Shift Keyed Infrared (ASKIR) is a form of modulation that represents a digital signal by varying the amplitude (“volume”) of the signal. A low amplitude signal represents a binary 0, while a high amplitude signal represents a binary 1.
BIOS	The Basic Input/Output System (BIOS) is firmware that is first run when the computer is turned on and can be configured by the end user
CODEC	The Compressor-Decompressor (CODEC) encodes and decodes digital audio data on the system.
CMOS	Complimentary metal-oxide-conductor is a type of integrated circuit used in chips like static RAM and microprocessors.
COM	COM is used to refer to serial ports. Serial ports offer serial communication to expansion devices. The serial port on a personal

	computer is usually a male DE-9 connector.
DAC	The Digital-to-Analog Converter (DAC) converts digital signals to analog signals.
DDR	Double Data Rate refers to a data bus transferring data on both the rising and falling edges of the clock signal.
DMA	Direct Memory Access (DMA) enables some peripheral devices to bypass the system processor and communicate directly with the system memory.
DIMM	Dual Inline Memory Modules are a type of RAM that offer a 64-bit data bus and have separate electrical contacts on each side of the module.
EHCI	The Enhanced Host Controller Interface (EHCI) specification is a register-level interface description for USB 2.0 Host Controllers.
GbE	Gigabit Ethernet (GbE) is an Ethernet version that transfers data at 1.0 Gbps and complies with the IEEE 802.3-2005 standard.
GPIO	General purpose input
IrDA	Infrared Data Association (IrDA) specify infrared data transmission protocols used to enable electronic devices to wirelessly communicate with each other.
L1 Cache	The Level 1 Cache (L1 Cache) is a small memory cache built into the system processor.
L2 Cache	The Level 2 Cache (L2 Cache) is an external processor memory cache.
LVDS	Low-voltage differential signaling (LVDS) is a dual-wire, high-speed differential electrical signaling system commonly used to connect LCD displays to a computer.
MAC	The Media Access Control (MAC) protocol enables several terminals or network nodes to communicate in a LAN, or other multipoint networks.

PCIe	PCI Express (PCIe) is a communications bus that uses dual data lines for full-duplex (two-way) serial (point-to-point) communications between the SBC components and/or expansion cards and the SBC chipsets. Each line has a 2.5 Gbps data transmission rate and a 250 MBps sustained data transfer rate.
POST	The Power-on Self Test (POST) is the pre-boot actions the system performs when the system is turned-on.
QVGA	Quarter Video Graphics Array (QVGA) refers to a display with a resolution of 320 x 240 pixels.
RAM	Random Access Memory (RAM) is a form of storage used in computer. RAM is volatile memory, so it loses its data when power is lost. RAM has very fast data transfer rates compared to other storage like hard drives.
SATA	Serial ATA (SATA) is a serial communications bus designed for data transfers between storage devices and the computer chipsets. The SATA bus has transfer speeds up to 1.5 Gbps and the SATA 3Gb/s bus has data transfer speeds of up to 3.0 Gbps.
S.M.A.R.T	Self Monitoring Analysis and Reporting Technology (S.M.A.R.T) refers to automatic status checking technology implemented on hard disk drives.
UART	Universal Asynchronous Receiver-transmitter (UART) is responsible for asynchronous communications on the system and manages the system’s serial communication (COM) ports.
UHCI	The Universal Host Controller Interface (UHCI) specification is a register-level interface description for USB 1.1 Host Controllers.
USB	The Universal Serial Bus (USB) is an external bus standard for interfacing devices. USB 1.1 supports 12Mbps data transfer rates, while

	USB 2.0 supports 480Mbps data transfer rates.
VGA	The Video Graphics Array (VGA) is a graphics display system developed by IBM.

Appendix

D

Watchdog Timer

NOTE:

The following discussion applies to DOS environment. IEI support is contacted or the IEI website visited for specific drivers for more sophisticated operating systems, e.g., Windows and Linux.

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMI or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer:

INT 15H:

AH – 6FH Sub-function:	
AL – 2:	Sets the Watchdog Timer's period.
BL:	Time-out value (Its unit-second is dependent on the item "Watchdog Timer unit select" in CMOS setup).

Table D-1: AH-6FH Sub-function

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. While the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the Watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

NOTE:

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system resets.

Example program:

```
; INITIAL TIMER PERIOD COUNTER
;
W_LOOP:

        MOV     AX, 6F02H       ;setting the time-out value
        MOV     BL, 30H         ;time-out value is 48 seconds
        INT     15H
;
; ADD THE APPLICATION PROGRAM HERE
;
        CMP     EXIT_AP, 1      ;is the application over?
        JNE     W_LOOP          ;No, restart the application

        MOV     AX, 6F02H       ;disable Watchdog Timer
        MOV     BL, 0           ;
        INT     15H
;
; EXIT ;
```

Appendix

E

Hazardous Materials Disclosure

E.1 Hazardous Material Disclosure Table for IPB Products Certified as RoHS Compliant Under 2002/95/EC Without Mercury

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated “Environmentally Friendly Use Period” (EFUP). This is an estimate of the number of years that these substances would “not leak out or undergo abrupt change.” This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the table on the next page.

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	X	O	O	O	O	X
Display	X	O	O	O	O	X
Printed Circuit Board	X	O	O	O	O	X
Metal Fasteners	X	O	O	O	O	O
Cable Assembly	X	O	O	O	O	X
Fan Assembly	X	O	O	O	O	X
Power Supply Assemblies	X	O	O	O	O	X
Battery	O	O	O	O	O	O

O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006

X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有"环境友好使用期限"的标签，此期限是估算这些物质"不会有泄漏或突变"的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
壳体	X	O	O	O	O	X
显示	X	O	O	O	O	X
印刷电路板	X	O	O	O	O	X
金属螺帽	X	O	O	O	O	O
电缆组装	X	O	O	O	O	X
风扇组装	X	O	O	O	O	X
电力供应组装	X	O	O	O	O	X
电池	O	O	O	O	O	O

O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。

X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。